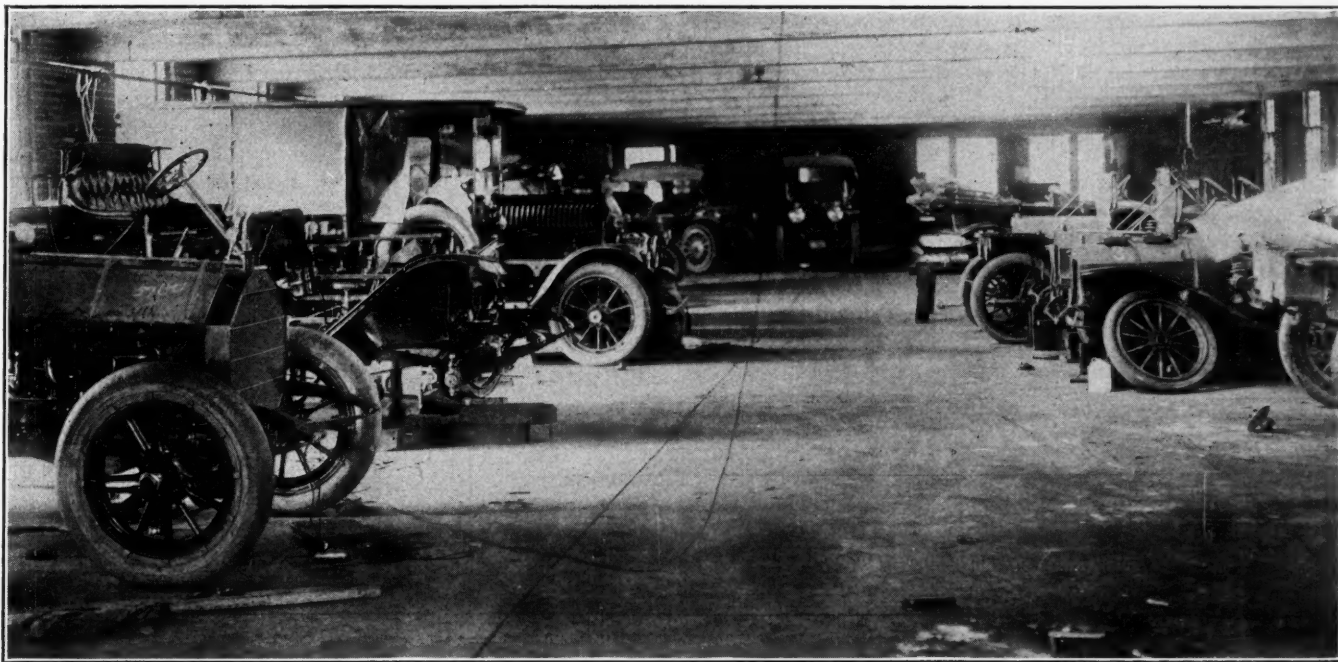


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No. 1



GENERAL VIEW OF GARAGE, SHOWING EXCELLENT LIGHTING.

MUNICIPAL GARAGE AT CINCINNATI

For Storing and Repairing Most of City's Motor Vehicles and Motorcycles—Police Patrols Housed at Police Stations—Repair Shop Equipment—Individual Records of Machines—Chauffeur's Daily Reports.

By KENNETH C. CARDWELL

City stables are, and have been for a number of years, as common as the use of horses by municipalities, and as necessary. Since automobiles for various transportation needs have come into general use, motors have to be cared for rather solicitously in order to give the best results, and this care, as owners even of a single car usually find out, can best be given at home, if the necessary expert attention can be had. This consideration is responsible for the fact that the city of Cincinnati, Ohio, which owns and operates between thirty and forty motor vehicles, not including twenty motorcycles, has for three years (since the number of machines owned warranted it) maintained its own garage in which to care for them.

The city still does all of its heavy hauling by means of horse-drawn vehicles, and none of its motor vehicles are trucks, strictly speaking, but all are intended for passenger use; although the machines used by the police department are of such size and power that they differ in no respect, as far as their general character is concerned, from trucks. As efficient and economical maintenance is the chief problem, however, the kind of machine is not so important as the way it is cared for;

and in the Cincinnati municipal garage every facility of the up-to-date automobile repair shop is available.

The garage, as a matter of course, is used for storage purposes for about thirty of the city's machines. The ten or eleven used by the police department as patrols are stored at the several stations, but those of the engineering, street-cleaning, building inspection and other city departments are stored and cared for at the garage. A majority of the machines are Fords, economy naturally being a primary consideration with the city. The Peerless used by the mayor and several other large cars also are handled in the garage, and the shop takes care of repairs for the police machines, including the chief's Hudson and fifteen Indian motorcycles.

This indicates sufficient work, considering the hard and constant use to which most of the machines referred to are put, for a fair-sized commercial garage; and, as a matter of fact, the force, consisting of a competent foreman with ten years' experience in garage work, a clerk, two machinists, two helpers, two laborers and two chauffeurs, is kept pretty busy with the duties which it is called upon to fulfill.

The location of the garage is rather extraordinary, as

it is on the second floor of a building owned by the city. The first floor is used by the downtown section of the street-cleaning department, and the second floor was originally used for part of the equipment and plant for the disposition of garbage. The garbage was dumped from this floor into separators, and burned and otherwise disposed of. A five-ton Warner hydraulic elevator, which was provided for the purpose of lifting the loaded wagons from the street level to the second floor, remains in service, and, being easily operated by one man and capable of lifting the heaviest cars or two Fords at a time, renders it a matter of no difficulty to place the machines on the second floor. The office clerk attends to the operation of the elevator, being called to attend to it by the ringing of a bell from the street.

The second floor is practically all one room, the only spaces cut off from it being the space taken up by the elevator, which is walled off with brick, the foreman's office and a locker room for the employees. The room measures 50 feet wide by 135 feet long, and has the advantage of being lighted on all three working sides by numerous windows, as well as from above. For this reason it is really much better than a ground-floor loca-

tion, where artificial light would probably have to be used most of the time.

The building is excellently constructed for this use, for it is of concrete and brick, and about as nearly fireproof as it could possibly be made. All of the windows, except those opening on the roof, are of wire glass, in metal frames, while the floor is of smooth-finished concrete and the walls of bare brick, giving absolutely no starting-place for a fire. In fact, the foreman, Anthony M. Sauer, reports that waste and other material has been permitted to burn out on the floor harmlessly on occasion. Gasoline is stored in a buried metal tank of 250 gallons capacity, in the rear of the building.

The mechanical equipment of the shop consists of a lathe, a drill-press, an emory wheel and an air-compressor, group-driven by a 4 horsepower motor. Besides these, there are five vises, with the usual hand tools used in a shop for various purposes. A long workbench extends along the east side of the room, with plenty of light directly upon the work from the row of windows. Near this are three pits, so constructed as to permit men to work under the cars without inconvenience.

Material for the use of the garage as well as for the operation of the cars, including not only ordinary parts, such as nuts, bolts and so forth, but tires, oils and gasoline, is purchased by the city purchasing department. It is disbursed, however, only on the order of the foreman or of the head of a department, and a record is kept of everything used. The drivers of the cars in each department must fill in a card showing mileage in detail each day, as well as any oil or gasoline obtained; and when a car is in the garage for repair a time-card accompanies it, as in properly operated private shops, upon which all work done and all material used are recorded.

Upon the requisition form used to secure material in charge of the purchasing agent, the number of the car for which it is desired is indicated, a copy of the requisition being retained; and this information and that obtained from the other record forms referred to afford a complete record of the maintenance cost of each machine of which the garage has charge. This record is carried forward in condensed form each month, on an extended report covering the total mileage of each car, the total cost of its maintenance for the month, and from these totals, the cost of operation per mile for the month.

This cost naturally varies considerably, subject to such factors as the kind of use to which the machine was subjected, the need for new tires (which would run the cost up rapidly), the size of the machine, and so forth. From the experience of the garage during the three years of its operation, however, the city's service department is able to say without qualification that a considerable saving has been accomplished by the plan of caring for the city's machines in its own garage, as compared with what the cost would be at a commercial garage.

Several reasons may be pointed out why a municipal garage is to the city's

GENERAL REPAIR TIME CARD				
NAME	DATE			
DESCRIPTION OF WORK	Started	Finished	Hrs. Min.	MATERIAL USED

REPAIR SHOP FORM HEAD.

DAILY TIME REPORT				
I hereby certify (1) that the following record of services performed by me this day is correct, (2) that the services were rendered in performance of official duties:				
NAME	LICENSE No.		CAR No.	
TITLE OF POSITION OR CIVIL SERVICE TITLE	DATE		191	
LEFT GARAGE AT	o'clock		Returned for the day at	
CYCLOMETER OUT			o'clock	
CYCLOMETER IN				
TIME	Time	PLACES VISITED	IN CHARGE OF	
Began	Ended	Elapsed		
FOR FURTHER PARTICULARS SEE REVERSE SIDE				
Department		Examined and approved		
Bureau or Division				

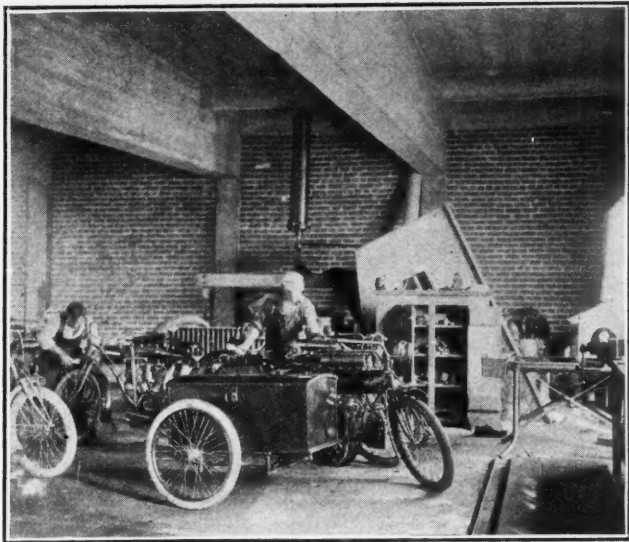
FORM FOR CHAUFFEUR'S DAILY REPORT.

On the back of this he fills in the amount and price of any gasoline or oil purchased, and from whom; also describes in detail any repairs, tire changes etc., made to the car.

PURCHASING DEPARTMENT City of Cincinnati				
Form 1 17m 2-27-14				
REQUISITION ON PURCHASING AGENT				
PURCHASING AGENT'S COPY				
Please purchase the following for _____ to be delivered				
to _____ on or before _____ 191				
ORIGINAL Dept. No. _____				
QUANTITY	UNIT	DESCRIPTION	QUANTITY ON HAND	
I hereby certify that the work or supplies above specified are necessary for				
stock		Storekeeper		
use		In this division		
Approved:		Superintendent		
Date		Director		
For Purchasing Department use only				
Date Received				
Req. No.				
Request for prices mailed				
Prices wanted				

REQUISITION BLANKS.

Made in triplicate; the others the same as the above except with matter at the bottom omitted.



MOTORCYCLE DEPARTMENT.

advantage from the standpoint of economy. For one thing, the time of the men working on the city's machines is charged against their maintenance cost only at the actual wage rate. For example, if a laborer getting, say, \$2 a day performs certain work, his time is charged on the record of the machine only at the rate of two dollars a day; and the same is true if a three-dollar helper does the work, the higher-priced mechanics doing only such skilled work as necessarily calls for their services; while in the case of a public garage the bill is made out to the owner of the car at a level rate, usually about 60 cents an hour, regardless of the wage-scale of the man who actually did the work.

Moreover (as suggested by the garage foreman, out of his long experience in commercial garages) the city saves money because only the actual time consumed is charged against the machines, and only needed repairs are made; no profit is made on repair parts, tires or other supplies; and when a car breaks down at a distant point and the service car kept in the shop goes out to repair the damage or tow the other car in, the time of the driver and his helper goes in at the actual rate of their wages and not at a flat sum per hour. It is perhaps needless to say that no conclusions morally derogatory to owners of commercial garages need necessarily be drawn from these considerations. Such shops are of course operated for profit, and must therefore charge a

profit on the services they render, as well as get all the work they can. The points suggested, however, indicate clearly where at least a part of the saving lies in the maintenance of a municipal garage and repair force, where there is a sufficiently large number of machines to justify it.

The garage is heated comfortably by steam at 20 pounds pressure, conveyed in "harps" of pipes along the lower part of the west wall of the room, only a foot or two from the floor. A concrete washing platform, over which is fixed a patented washing device with a swivel arrangement by means of which the man washing the car can go completely around it without twisting the hose, is an interesting and useful piece of equipment. Only small bits of painting are done in the garage, complete jobs of this sort being sent to a regular paint-shop, as being outside of the proper scope of the work of the garage.

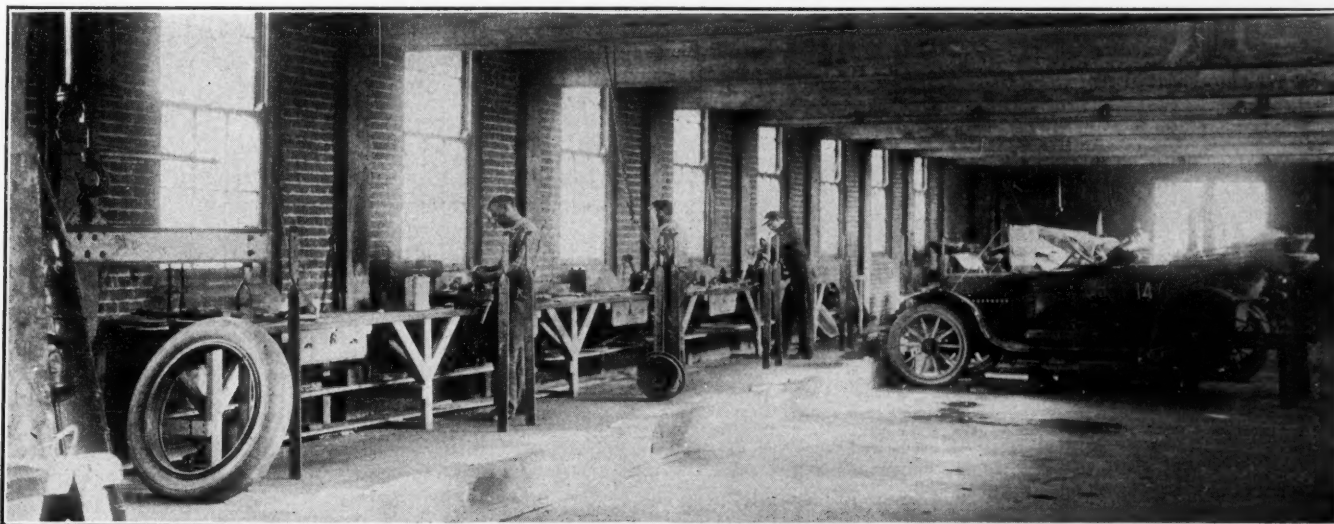
SELECTION OF PAVING MATERIAL*

Method of Determining the Relative Values Under Given Conditions of Stone, Brick, Wood, Asphalt and Other Bituminous Pavements—Qualities of Each.

The general development of the paving industry has been such that at the present time stone, wood, brick, asphalt and the other bitumens are considered standard paving materials. This development has been brought about gradually and by the use of a great number of experiments, pavements having been laid in this country of wood, asphalt, coal tar, cement concrete, iron, brick, India rubber, shells, gravel, slag blocks, and even glass, leather and hay.

In considering the different kinds of material it is necessary first to establish a standard for a perfect pavement and study its different properties. A perfect pavement should be cheap, durable, easily cleaned, present light resistance to traffic, be not slippery, be easily maintained, favorable to travel, and sanitary. Admitting that a perfect pavement should have these properties, it must be understood that they are not all of the same importance, but by a discussion of these different properties, and assuming that a perfect pavement has a value of 100, it will be possible to assign a percentage value to each.

*Slightly condensed from paper before Cleveland Engineering Society by George W. Tillson, consulting engineer to the president of the Borough of Brooklyn, New York.



SHOWING REPAIR PITS AND PART OF MECHANICAL EQUIPMENT.

COMPARISON OF PROPERTIES.

Cheapness: It matters not how good or how adaptable any material may be, unless the authorities have money enough to use it, it is not available. So that cost must be considered as much in the examination as it would be by a private individual if he were about to purchase any article for himself. The question then resolves itself into what is the best that can be obtained for the money at hand. Cheapness is given a value of 15 by the author.

Durability: Durability is an economic and an important factor. It depends, however, upon a great many conditions. There are some materials which have a certain life only, no matter what the traffic, because they will be destroyed by the action of the atmosphere. This is true of asphalt and untreated wood, and treated wood to a certain extent. With stone, brick and such imperishable materials, the durability depends almost entirely upon the amount and character of the traffic. The influence of traffic, however, is governed by several conditions, namely, the width of roadway, character of the pavement, presence or absence of street car tracks, state of repair, and how well the pavement is cleaned.

It can be easily understood that the width of the roadway is an important factor, although of course traffic should be measured by the tonnage per foot or yard of width. This, however, must be somewhat modified, as in a narrow roadway the traffic both ways is confined almost to the same lines, so that the wear will be greater for the same amount of traffic than if the roadway were wider, permitting vehicles to move freely in the portion of the roadway assigned to their use.

By character of pavement is meant the detailed method used in laying the different materials; for instance, if a block pavement is used, the character of the foundation, joint filling and method of laying; asphalt pavement, according to the mixtures; and wood pavement, whether the same is treated or not and the method of laying.

The presence of car tracks on a street makes a material difference in its life, for the reason that the traffic is confined almost to one line on each side of the track. In a report of the city of Buffalo, where careful records have been kept of the life of asphalt pavements, it is stated that the presence of street car tracks will diminish the life of the pavement two years.

Whether or not a street is kept in good condition makes a great difference in the life of the pavement. If a pavement be kept smooth so that traffic can be brought upon it perpendicularly, the wear will be reduced to a minimum. If, however, the pavement is allowed to be rough so that the wheels of vehicles strike it irregularly and with abnormal force, the wear is much greater than it should be. While this is particularly true of a block pavement it applies to a certain extent to sheet pavements.

The effect of street refuse on a pavement depends upon the character of the pavement itself. If it be of asphalt, and the refuse is damp or moist to a considerable extent, it will have an injurious effect upon the surface. If, on the other hand, the pavement be of stone or brick, the refuse on the pavement will reduce the wear from traffic and not injuriously affect the material itself. This question, however, is not as important as it was some years ago, as all cities recognize the necessity of keeping pavements clean.

Taking all things into consideration, durability is given a value of 21.

Easiness of Cleaning.—This is an economic factor, although the state of cleanliness of a pavement has a bearing upon its sanitary influence, so that the degree to which a pavement can be cleaned by ordinary ap-

pliances and without undue expense is important. For that reason a value of 15 is given easiness of cleaning.

Resistance to Traffic.—This is an exceedingly important consideration. Street pavements are constructed primarily for the transportation of vehicles throughout the city, and anything that will reduce the traction required to move the loads is highly important. This property, therefore, has been given a value of 15.

Non-Slipperiness.—The slipperiness of a pavement depends upon its material and detailed construction, also its condition. The efficiency of a horse varies with his foothold. It does not matter so much what his strength is, if he cannot apply it to the best advantage. Any material that will allow him to do this has a particular value. It is varied to a great extent by the condition of the pavement; for instance, the presence of sleet or snow. Taking all matters into consideration, non-slipperiness is assigned a value of 7.

Maintenance.—The maintenance of a pavement is closely allied to first cost, and in considering the entire cost of a pavement the expense of maintenance is an important factor. This, of course, depends not only upon the character of the material itself, but also upon the traffic the street receives. It is unquestionably a fact that a certain amount of traffic is beneficial to wood or asphalt pavements, as it keeps the upper surface of the pavement dense and to a certain extent impervious to water, while, as has been said before, the imperishable materials wear in accordance with the amount of traffic. This property has been assigned a value of 10.

Favorableness to Travel.—By favorableness to travel is meant the ease and comfort which are enjoyed by driving over a smooth pavement and also the decrease in wear and tear on vehicles on a smooth pavement as compared with one that is rough and uneven. The first of these characteristics can be appreciated by anyone driving in the streets. While the wear and tear on vehicles cannot be exactly computed, information obtained from large department stores in Brooklyn shows that the changing of the old cobblestones of the borough into asphalt has very materially reduced their cost of repairs. In a paper read before the Institution of Civil Engineers in England in 1871 it was stated that the new pavements which had recently been constructed in Liverpool had made a saving of \$50,000 per year for every mile of pavement on the dock lying streets, without counting the reduction to the wear and tear on horses and vehicles. This property will be of more value and receiving more attention on account of the introduction of automobiles and motor trucks. At the present time it is assigned a value of 5.

Sanitariness.—The sanitariness of pavements is increasing in importance from year to year as more attention is given to health conditions in our large cities, and the fact that certain pavements can be more thoroughly cleaned and that the material itself does not absorb moisture are not the only considerations. Schools and hospitals are increasing in number in all of our cities, and it is a recognized fact that as noiseless a pavement as possible is necessary in front of both. Not only that, but in the large office buildings where a great many clerks are employed from day to day the noise caused by heavy vehicles driven over a rough stone pavement has a disturbing effect upon the nerves. While this may seem a little extreme, it is an important consideration. This property, therefore, is rated at 13.

Table No. 1 illustrates the use of these values in comparing granite, wood, asphalt and brick. Under cheapness, for instance, asphalt is given the full value as being the cheapest; brick costs 14-11 as much as asphalt and granite and wood each 14-8 as much. (These ratios of prices would, of course, vary in different localities.)

Table No. 1—Comparison of Paving Materials.

	Per Cent	Granite	Wood	Asphalt	Brick
Cheapness	14	8	8	14	11
Durability	21	21	16	15	16
Easiness of cleaning.....	15	10	14	14	15
Light resistance to traffic.	15	13	14	12	15
Non-slipperiness	7	7	4	5	6
Ease of maintenance....	10	10	8	6	6
Favorableness to travel..	5	2	5	4	3
Sanitariness	13	9	13	12	10
Totals	100	80	82	82	82
Cheapness eliminated....		72	74	68	71

Properties Considered Essential in Three Typical Classes of Street.

Heavy Traffic.	High Class Residential.	Ordinary Residential.
Durability; Light resistance to traffic; Non-slipperiness; Ease of maintenance;	Ease of cleaning; Non-slipperiness; Favorableness to travel; Sanitariness;	All but light resistance to traffic.
Totaling the values given to these several properties, we have—		
Granite, 51; brick, 43; wood, 42; asphalt, 38.	Wood, 36; asphalt, 35; brick, 34; granite, 28.	Brick, 87; asphalt, 70; wood, 68; granite, 67.

VALUES FOR DIFFERENT MATERIALS.

Stone Pavements.—Granite and the harder sandstones are those that are principally used in the stone block pavements of this country. The particular kind to be used will depend upon the availability and cost. It would be foolish to consider granite as a material where it must be obtained at great expense and where a good sandstone is available. In this study, however, granite is considered, as it is a material that is used in New York City and one with which the author is most acquainted.

In this connection it should be stated that the figures arrived at in this study by the author must be varied in every locality and must vary to a great extent according to the judgment of each individual engineer. He wishes it understood, however, that he does not consider the exact figures as of so much importance as the method of obtaining the results. So that too much importance should not be given to the results shown.

The granite pavements of today are very much better than those that were laid even four or five years ago. It has been found that on account of their being laid on a concrete foundation it has been possible to reduce the depth of the blocks and make them of somewhat smaller size otherwise, thus rendering it possible to get a better cut block at the same expense as before and allowing the blocks to be laid with a closer joint, thus reducing abnormal wear.

The blocks are laid on a sand cushion on a concrete base, the joints being filled with cement grout, tar and gravel, tar pitch alone, and sometimes a combination of pitch and sand. The author believes that with a small joint and a combination of good pitch and sand the best results will be produced. While a cement grout joint makes a smooth pavement, it is often difficult to close the street long enough to allow the cement to set, and it also makes a pavement that is exceedingly difficult to repair after it has been torn up for any substructure purposes.

In considering the value of different materials as applied to different streets it is assumed that an intelligent selection of the different materials has been made, as upon that will depend the results entirely. For instance, a granite pavement could be laid on a residence street with light traffic, where its durability would be long and

the cost of maintenance practically nothing. On the other hand an asphalt pavement could be laid upon a heavy business traffic street, where its life would be short and the cost of maintenance enormous. If, however, an intelligent selection of material is made for all streets of the city, what will be the natural life and cost of maintenance will be found.

In 1913 in the Borough of Brooklyn the granite pavements cost 3.9 cents and the Medina sandstone 6 mills per square yard, all on concrete.

Considering all the properties of a perfect pavement and taking them up in detail, for granite pavements values have been given as shown in the accompanying table.

Wood Pavements.—Wood pavements have been laid at intervals in this country for some seventy years. The first pavements were not only of untreated wood, but of wood selected without much regard for its natural durability. The result was failure, as could have been expected. The repeated failures of the different kinds of wood, however, although they delayed, did not prevent entirely the establishment of wood in this country as a standard material. The success of the wood pavements in Europe made it positive that they could be laid successfully in this country under proper conditions.

The first treated wood pavement in this country was laid on Tremont street, Boston, in 1900. This pavement has been in use during this entire period with very small repairs, and is in good condition at the present time. It is composed of blocks treated with a composition made up of one-half creosote oil and the other half resin. Pavements of this character were laid in New York and other cities, but on account of the increased price of resin it was dropped out of the mixture and creosote oil only used.

There has been a great deal of controversy as to the character of the creosote oil to be used for this purpose, the principal point being the specific gravity. The theory of mixing the resin with creosote was that, it being a more stable material, it would prevent the volatilization of the creosote and so preserve the blocks from decay for a greater length of time. The object of treating the wood is to prevent decay and also to make the blocks stable by preventing the absorption of water so that they will not shrink in dry weather or swell in wet and thus cause bulging. It was thought that by using a heavier oil this result could be obtained as well as by the use of a light oil with resin. The relative values of the heavy and light oils have never been agreed upon, but the author has always been in favor of the heavier oil.

The present method of laying wood pavements in this country has not been in use long enough to determine what the cost of maintenance is, but figures obtained from St. Louis, Minneapolis and other cities indicate that it is exceedingly small. The first pavement of this character to be laid in Brooklyn was in 1902, and it has had practically no repairs for wear and tear since laid. It is, however, on a light traffic street. The total cost of maintenance of the wood pavements in Brooklyn in 1913 was 1.4 cents per square yard on pavements that had been in use from eight to eleven years. This cost, however, included, besides actual wear and tear, damage caused by openings in the pavement, although not the cost of repaving the openings themselves. In Paris in 1911 the cost of repairs was 26 cents per square yard. In London the average cost is 20 cents per square yard.

The fillings for joints in wood pavements are sand, asphalt or coal tar pitch, and cement grout. The practice in Brooklyn has been to fill the joints with sand, and first class results have been obtained. Some people,

however, prefer the bituminous and others the cement filler; either will give good results when properly used, although the author does not look with much favor on the cement grout filler.

There is no question that wood block is an important paving material, and on streets where the traffic is heavy and noise is a great detriment it is most advisable. Its strongest point is its noiselessness and its weakest its slipperiness.

Brick Pavements.—The first brick pavements in this country were laid in Wheeling, W. Va., in 1870, but the material did not come into general use for some time. The author is free to confess that when his attention was first called to brick as a paving material he was not favorably disposed, but the success of the material after it was put into use was such that he was obliged to confess the error of his previous judgment. Many failures have occurred in brick pavements because people did not understand the difference between bricks, and it was not easy in the early days of the industry to determine previous to its use whether a certain brick would or would not make a good pavement, and then it was not known what was the best method of laying. Both of these matters, however, have been fully threshed out, and, in the judgment of the author, this is mainly due to the work of the National Paving Brick Manufacturers' Association, which has maintained a paid secretary to look after the interests of the brick manufacturers, not simply to enable the manufacturers to sell their product, but that every city should get the best possible brick pavement obtainable.

With the present knowledge of the art of making brick and the methods of testing and laying, it is as possible to determine in advance what the results will be with brick as with any natural material.

It is conceded, of course, that brick pavements, like all others, must have a good foundation so that the question at issue, after the bricks themselves have been determined upon, is principally the cushion on the concrete and the character of the joint filling. The National Paving Brick Manufacturers' Association has always been very strong in advocating a 2-inch sand cushion laid upon the concrete. Most engineers in the East, however, believe that only 1 inch is necessary and that no more should be used, the idea being that all that is required is to have a sufficient quantity to allow the brick to be well bedded and have an even bearing over its whole surface.

Three kinds of joint filling have been used: sand, coal tar pitch, and cement grout. At the present time sand is not used to any great extent, as it is conceded that a material should be used that will protect as much as possible the corners of the bricks so that the wear may be in accordance with the principle previously laid down in this paper—as nearly vertical as possible.

The question of coal tar pitch and cement grout cannot be so easily dismissed, however. The advocates of both materials are very many and present strong arguments, and it must be admitted that good results have been obtained with both kinds of filling. The author believes, however, that if proper care be taken in the laying and in the application of the filler, cement grout will give the best results, as it will come more nearly to making the pavement a monolith. Some trouble has occurred in the past with this filler on account of the rumbling of the pavement under traffic. This trouble, however, has been nearly if not entirely obviated. There is the objection to a cement filler, however, that it is more difficult to open a pavement and replace it in case it becomes necessary on account of the subsurface work.

It is almost impossible to set any figure for the life of

a brick pavement or the cost of repairs, as these depend almost entirely upon traffic. The figures given in the table have been made out principally from data received from large cities; but, as has previously been said, all figures of the table must be adapted to local conditions.

Sheet Asphalt.—Under the head of asphalt will be considered sheet asphalt, asphalt blocks and bitulithic, although the last is perhaps more often made with coal tar pitch than with asphalt.

The first pavement of any note of this character was laid on Pennsylvania avenue, Washington, D. C., in 1876. So great was its success that it soon came into general use all over the country. While called asphalt pavement, it is almost entirely composed of sand, as the standard pavements have but 10 to 12 per cent of bitumen, which is the valuable property of the asphalt, the rest being made up of sand and a small portion of stone dust. The pavement is pleasing in appearance, smooth, not noisy, and on light traffic streets seems to be almost ideal. It is more slippery than the hard block pavements, and in the coast cities it is not generally laid on grades over 3 or 4 per cent. In the interior, however, where the atmosphere contains less moisture, it is often used on grades as high as 7 per cent without trouble.

Data collected from the cities of Brooklyn, Boston, Buffalo, Chicago, New York, Philadelphia, St. Louis and Washington show that these cities in 1890 had a total of 246 miles of asphalt pavement, and in 1911 2,348 miles. This gives an idea of the popularity of the pavement, although it must be taken into consideration that this was during a period when there was great activity in laying new and smooth pavements. In Brooklyn, for instance, in 1895, there were 18 miles of asphalt pavement, while at the present time there are 540 miles. Brooklyn is a residential city, without many steep grades, and one to which this material is particularly adapted.

The cost of repairs to the asphalt pavements in the Borough of Brooklyn in 1913 was 3½ cents per square yard, and in the Borough of Manhattan for 1912 it was 14.1 cents per square yard, this being due to a great extent to the difference in traffic in the two cities. In the city of Paris in 1911 the cost was 19½ cents per square yard.

In Berlin asphalt repairs are made by contract. The price paid is for streets from 5 to 20 years old, 10 cents per square yard; from 20 to 30 years old, 12½ cents per square yard; from 30 to 40 years old, 15 cents per square yard.

In London the contract price on Cheapside per yard per year was 56 cents for 15 years beginning after the pavement had been down 2 years. The average cost of repairs in London is 30 cents per yard.

Asphalt Block.—This is another form of asphalt pavement and consists of blocks, made under heavy pressure at a central plant, composed of asphalt and broken stone aggregate rather than sand. The mixture of the material can be absolutely regulated and the pressure made uniform, so that the blocks produced should be uniform in density and quality. On account of the stone aggregate being coarser (say from ¼ inch downward) than the sand, the surface of the pavement affords a better foothold than the sheet asphalt, and also on account of the joints between the blocks; so that where a smooth pavement on grades is desired asphalt blocks are particularly desirable. They are used, of course, to a great extent, on streets of light grades.

An objection to them is that, as they have to be manufactured at one location, the entire surface of the pavement must be transported from the plant to the street, while with sheet asphalt the plant can be located at a convenient point, so that the haul is not so long. This

makes a difference in the expense against the asphalt blocks. On the other hand, however, an asphalt block pavement can be repaired without the use of a mixing plant, as the blocks can be purchased and brought upon the street and used when desired.

Asphalt block pavements in the Borough of Manhattan in 1912 cost 9.8 cents per square yard for repairs, and in the Borough of Brooklyn for 1913 1.2 cents per square yard.

Bitulithic Pavements.—This pavement was first laid about ten years ago. A gentleman who had formerly been interested in asphalt pavements conceived the idea of improving the then existing methods of laying a macadam pavement by filling a portion of the voids with a bituminous product or bitumen mixed with some other material. By the gradual elaboration of his original idea there was evolved a pavement which is now known as "bitulithic." It is essentially a macadam pavement of selected and graded stone, so that the voids in the stone shall be as small as possible, the binder being a bitumen, either coal tar or asphalt, both having been used. The pavement, being formed of coarse materials, can be laid on quite steep grades with satisfactory results. The writer has had no personal experience with this material, but has observed its construction and use in other cities. It has been laid very extensively in this country and would undoubtedly have been used to a greater extent if it were not patented. It is considered as standard and ranks with asphalt pavements.

Sheet asphalt, asphalt block and bitulithic pavements are given the same values in the tables, under the head of asphalt.

TRAFFIC AND OTHER CONDITIONS AFFECTING CHOICE.

Knowing, however, the kind of material and the properties thereof is not sufficient for the official whose duty it is to determine the particular one to be used. He should also know the requirements of the streets to be paved. In order to do this he should have records of the kind and character of the traffic upon each street, or upon typical streets. Of course it is not necessary to get a total census of traffic on all residential streets, but of those where by an inspection it can be told to what class they belong.

And in speaking of traffic it should be understood that as at present considered the words "heavy," "medium" and "light" traffic mean very little, except with reference to any one particular city. There should be a standard unit of traffic, so that when the traffic on a certain street is given it could be distinctly comparable with traffic in another city. To do this it is necessary that the effect of traffic upon the different materials be known. Little attempt has been made to determine this. It can be easily understood that a vehicle weighing with its load 15 tons will have an entirely different effect upon a pavement than fifteen vehicles each weighing 1 ton. It makes a difference, too, whether the tires are steel or rubber, whether they are 1 inch or 3 inches in width, and whether the vehicle is moving at a rate of 6 or 30 miles an hour. Experiments can be made so that the wear of the different vehicles under different loads can be ascertained and referred to one unit, and until this is done the adjectives "heavy," "medium" and "light" must be considered very indefinite.

In addition to this, there are certain local conditions which must also be taken into consideration. For instance, if the traffic requirements are such that a brick or stone pavement should be used for economic reasons, it is possible that hospitals, school houses or churches may be situated on certain portions of the streets, so that it would be necessary to lay wood on account of its noise-

less property. Then, too, the official will learn that the wishes of the users of the street and those doing business on it must also be taken into consideration, and he often finds that the two will conflict, as the truckman cares nothing about the noise and the businessman cares little for tractive or non-slippery properties. So that, despite all information that can be obtained, in order to arrive at a satisfactory result the different conclusions must be treated together and intelligently. If, however, all these matters are taken into consideration, it is seldom that an improper determination will be made.

SEWAGE TREATMENT.*

Fundamental Considerations in the Design and Maintenance of Sewage Treatment Works Which Should Be Understood by Municipal Officials.

DESIGN.

Very few towns voluntarily take up for consideration the installation of sewage treatment works, for it seldom occurs that the discharge of municipal sewage into a water course menaces the health of the people living in that community to an extent that they, on their own initiative, assume the considerable outlay of money needed for sewage treatment works. Works of this kind are not revenue producing, but must be recognized as undertakings involving, for success, constant care and supervision and necessarily liberal expenditure. Usually such outlay of funds is made to obviate damages caused by the pollution of the water courses or on order issued either by the courts or some constituted state authority. Hence, it is important that officials and the public in towns about to install sewage treatment works should know how to proceed in order to secure the proper kind of works.

No one method or no particular combination of processes is best for adoption in every case. The best treatment is that which, including first cost and cost of maintenance, will most economically produce an effluent suitable for discharge into the local water courses.

The use to which the stream is put and the available water for dilution should be factors in the design of every plant, and treatment should not be carried further than is made necessary by the conditions of the stream which is to receive the sewage after treatment.

Where streams are used as sources of water supply for nearby towns, a higher standard of effluent is required than where the purpose of the treatment works is only to prevent nuisance.

The composition and condition of the crude sewage partly determines the kind of treatment necessary to obtain the required effluent.

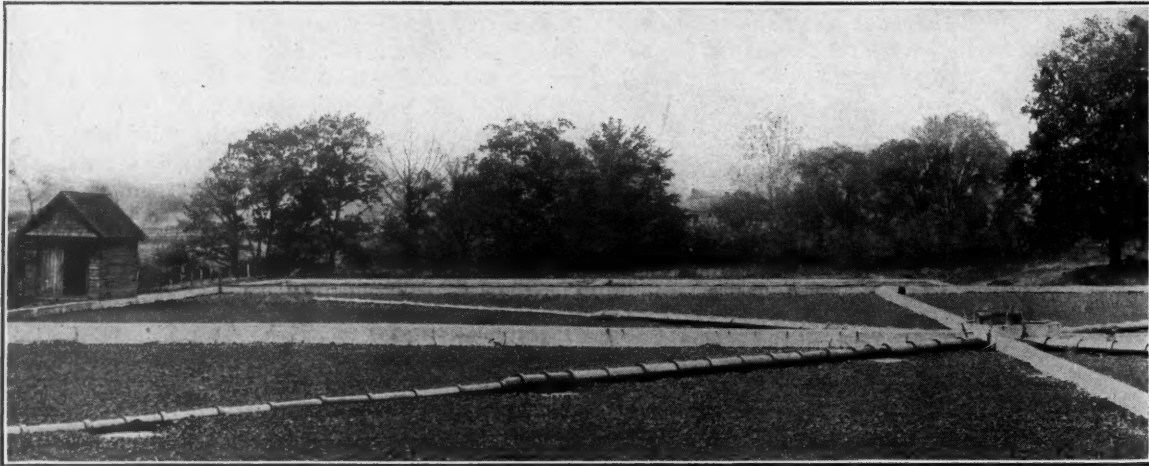
Local conditions, such as the kind of sewer system already in use or contemplated; topography of the town; the availability of different construction materials; number and character of population; the presence or absence of industries whose wastes may have to be considered; the probable future development of the town; and, finally, the financial ability of the community, are all controlling factors in the design of the works.

A good design is important and much first cost can be saved by an experienced engineer in adapting the design to the local conditions; but intelligent supervision after the plant is put in operation is still more important.

A plant designed for partial treatment which is properly operated is better than a more highly developed plant which is neglected or operated without regard to the essential theory on which the design was based.

The time has passed when the desirability of any treat-

*Report of committee of American Public Health Association, consisting of George S. Webster, Chief of the Bureau of Surveys of Philadelphia, chairman; Frank A. Barbour, George A. Johnson, Langdon Pearse and F. Herbert Snow.



CONTACT BEDS WITH HAND GATES AND TILE PIPE DISTRIBUTORS.

ment should be predicated on the fact that little or no attendance is required. Rather, all disposal works should be recognized as machines which require intelligent supervision and which, if properly designed and maintained, can be made to produce just that quality of effluent which the diluting capacity of the local stream will render satisfactory. In this way greater general progress in the betterment of stream conditions will result.

It will frequently happen that, in small streams, the dry weather flow can with profit be increased by the intelligent use of stored upstream water and the discharge of a partly treated sewage thus made possible at all seasons.

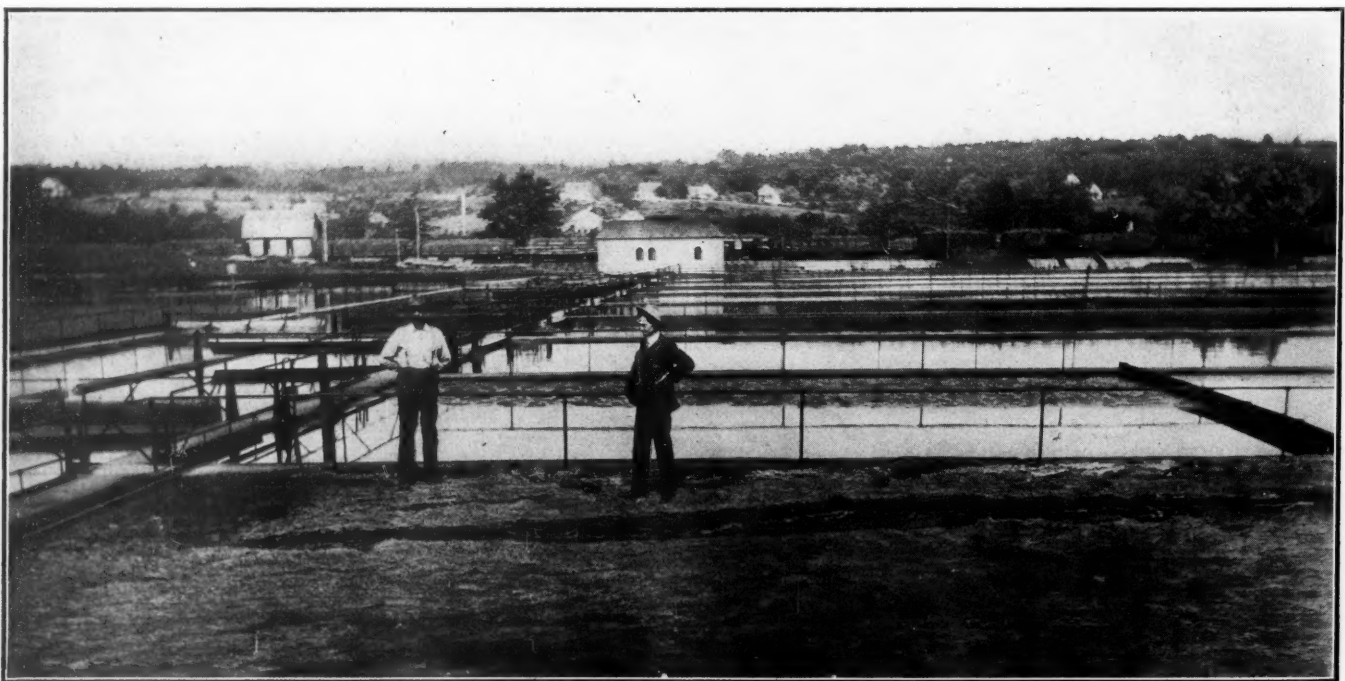
In designing a plant for any community it should be made of adequate capacity, not only for the present, but to meet the needs for some years to come, in order to prevent surprise at the increased load and the consequent overload in a few years. Where the growth of a town is very rapid, it may be possible that the increase of population and the infiltration of ground-water may tax the sewerage system and sewage disposal plant to its full capacity by the time the works are completed, thus resulting in a plant which does not meet popular expectation.

On the other hand, where the two-story type of tank is adopted, care must be exercised that the tanks are not

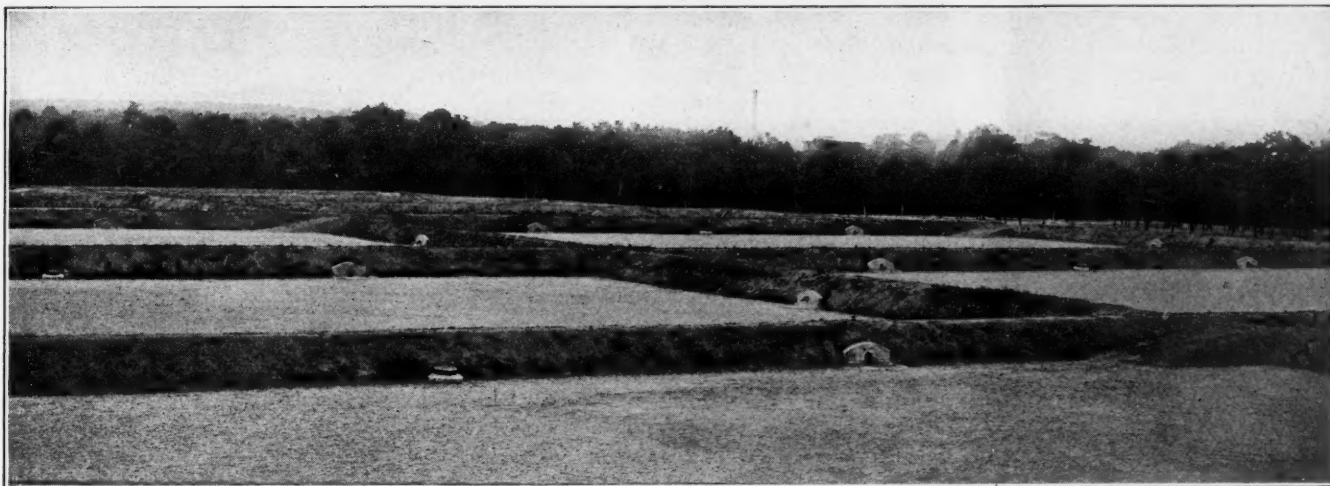
made too large, as under such circumstances they are liable to fail of their purpose by reason of the sewage in the settling chamber becoming septicised and creating a nuisance.

To overcome these conditions a comprehensive plan for the works should be adopted which will provide for a sufficient number of units to be added as the necessity develops and as the art of sewage disposal advances.

Town authorities should not deal with the proprietors of any patented processes or devices for sewage treatment without the assistance of some competent advising engineer. The treatment of sewage has always seemed to be a particularly fertile ground for the exploitation of patented methods, from the early days of the many processes of chemical precipitation to the present-day electrolytic treatment; and many of these, while apparently successful in experimental plants, are entirely unfeasible on a practical scale. There is danger in deducing results from small test apparatus without scientific study by a qualified expert. Often the cost of such treatments, when undertaken practically, is prohibitive. The proprietor of a process who is looking for a contract will give a bond and make various propositions which appeal to the people of a town and is likely to lead them to favor the acceptance of such propositions. Many costly mistakes have been foisted on communities in this way.



SEDIMENTATION TANKS. SEPTIC TANK IN FOREGROUND WITH SCUM SUPPORTING WEIGHT OF MEN.



ONE CORNER OF A SAND FILTER PLANT.

The problem of sewage disposal is not one to which a ready made solution is applicable, but each case should be studied so that its peculiar needs may be met in the most efficient manner and with the most economical expenditure of funds.

In many of the thickly populated states the location of the treatment works, the type of works and the details thereof must be approved by some state commission or department of health. Where possible, it is desirable that there shall be preliminary visits to the proposed sites by the agents of the state and town, as this may obviate the preparation of plans for two or more sites. Usually such preliminary conferences will also result in an agreement as to the general type of plant required. Where there is no state supervision, the town authorities must depend upon the advice of the expert they employ.

One of the most important matters to be considered, and one which greatly concerns a community, is the location of the treatment works. As a general proposition it is advisable to select a site remote from habitation and public highways, for while it is possible, with properly designed and constructed sewers and treatment works, to maintain inoffensive conditions by careful operation, it

must be recognized that by the very nature of its work a sewage treatment works can never hope to compete, in point of odor, with a peach orchard in bloom.

PROCESSES.

The processes available for sewage treatment may, for convenience, be divided into three groups:

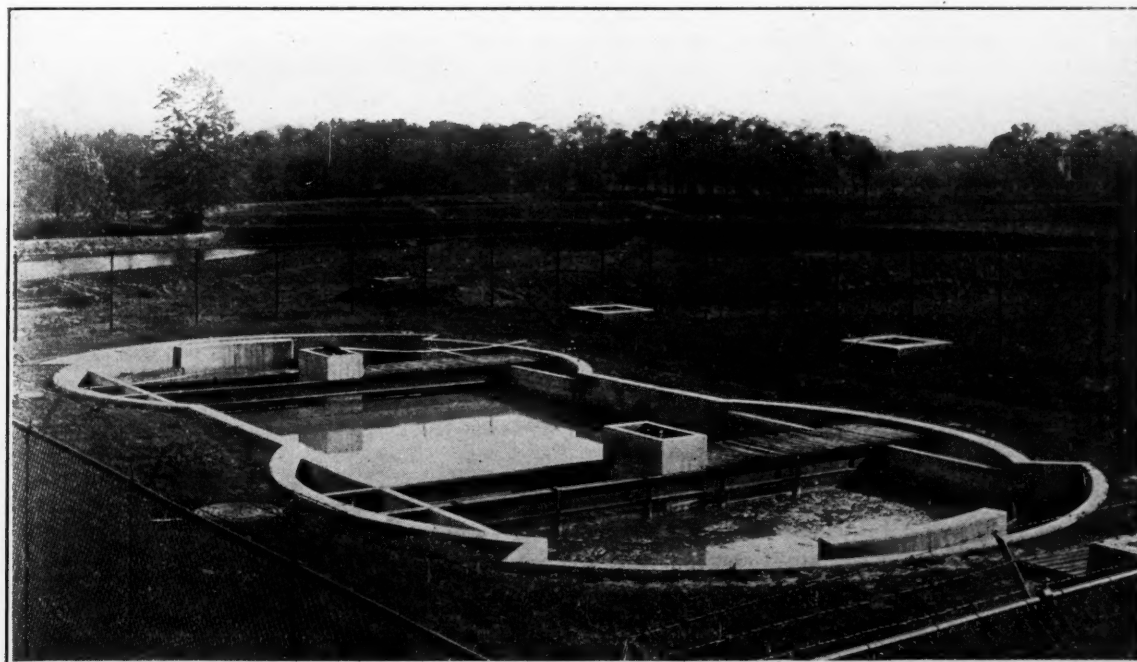
(a) Clarification or the removal of suspended matter by means of fine screens or sedimentation tanks.

(b) Oxidation or the conversion of the decomposable matters into more stable forms by means of biological forces in intermittent sand filters, contact beds or percolating filters.

(c) Disinfection or the destruction of bacteria, usually by means of hypochlorite of calcium.

The many different devices under each heading may allow of a large number of combinations and selection should be based on the economical phase of the problem.

Certain processes, which are very efficient when under the watchful care of scientifically trained operators provided with a laboratory, would be unwise to adopt for a community whose finances will not allow of such annual expense. In such cases higher first cost of installation may prove to be more economical in the end.



IMHOFF TANKS. SCUM FORMING IN FOREGROUND OR ENTRANCE END.

Usually the first process of treatment is the removal of the solid matters which have been maintained in suspension by the velocity of flow in the sewer. In the past, when the solids were allowed to settle in tanks in which the sewage flowed over and in contact with the putrescent deposits in the bottom, odors resulted. Also, when the deposit from such tanks (called "sludge") was placed upon the ground or upon drying beds, the foul emanations added to the nuisance; but within recent years two-story tanks have been devised and are in successful operation whereby the sewage is settled for a short period of time in the upper story and the sludge allowed to remain in the lower compartment of the tank sufficiently long for the decomposable matters to digest, and the settling sewage is kept from coming in direct contact with the digesting sludge. Such tanks will discharge an effluent practically free of settleable matter in nearly as fresh a condition as when received. The gases evolved during digestion of the sludge away from contact with the sewage are principally methane or marsh gas and carbon-dioxide, both of which are inodorous. Sludge withdrawn from such tanks after digestion is inoffensive, dries quickly and may be used for filling low land or for agricultural purposes with no danger of nuisance.

If the conditions require more refined treatment than sedimentation, it becomes necessary to adopt processes for oxidation. This may be accomplished by means of intermittent sand filters, contact beds or sprinkling filters, the choice of which is largely dependent on the availability of different construction materials and the size of plant to be installed. Intermittent sand filters are economical only where large areas of sandy soil are available. The cost of procuring sand and fine gravel and transporting it for a distance makes this type of filter prohibitive in other sections, except for small installations. The sprinkling filter, on the score of economy and on account of the maximum efficiency secured on a minimum area of land, is generally given preference; yet under certain condition contact beds are justified.

The present-day tendency is to adopt processes which will maintain as far as possible aerobic conditions in the liquid at all stages through the plant; the maintenance of such aerobic conditions is the primary consideration in avoiding nuisance.

As the purpose of disinfection is the destruction of pathogenic bacteria, in order to provide a double safeguard against water-borne diseases, it can be said generally that disinfection of sewage is an unnecessary refinement unless the effluent of the sewage treatment works is discharged into a water course adjacent to and above the intake of a water purification plant, and even in such a case the responsibility of protecting the public health should rest upon the purification of the water.

It is not practicable to disinfect crude sewage containing particles of organic matter of appreciable size, as with the usual period of contact it is impossible for the disinfectant to penetrate the solids.

ODORS.

The amount of odors depends largely on the freshness of the sewage and the method of treating and handling the sludge. The freshness of the sewage depends largely on time of travel and the design of the collecting system, on the adaptation of size to discharge, the provision for self-cleansing velocities and on the ventilation of the sewers so as to provide as much natural aeration to the liquid as possible. If the sewage is fresh (in other words if it contains dissolved oxygen) there will not be serious odors from the application or treatment of the liquid portion, provided the plant is maintained with no lodgment of sewage in pools or overloading of the surface of the filters.

In the sludge there is a potential cause of odors, but by the use of the more modern type of tanks, with thorough digestion of the decomposing solids and discharge on properly prepared sludge drying beds, under favorable weather conditions, no odor of serious moment, noticeable more than a few hundred feet, should ever occur. Odors can be largely eliminated by good design, but their occurrence depends more particularly on proper supervision of the plant.

By the use of the two-story sedimentation tanks, which provide for the digestion of sludge, and by care in the management of the works, plants are operated in Europe and in this country where no odors are noticeable either from the sewage or from the sludge during drying.

In plants where other methods of treatment are adopted, it is probable that odor will be produced. It has been estimated that at such a plant capable of treating the sewage of 50,000 people, with good management, no odors should ever be apparent beyond 1,000 to 1,200 feet from the works, even when sludge is being discharged upon the drying beds or in the spring when the filters are in bad condition due to the past winter interfering with work being done on them.

With smaller plants this distance should be less and with larger plants possibly more. By diffusion, of course, the odor becomes more faint as the above-named distances are reached, and beyond these distances no odor should be noticeable. What might be termed odors strong enough to be disturbingly disagreeable to a person whose nasal sensitiveness is not affected by his knowledge of the source of the odor should perhaps never be found at a distance more than one-third of those mentioned. It should, however, be noted that an odor from a sewage plant which, if from a farm, would never be noticed or which would be accepted as simply natural and reasonable, will generally develop complaints of nuisance. Sentiment, regardless of facts, frequently blames on an inoffensive sewage disposal plant bad odors arising from other sources. In short, sewage treatment works should be as isolated as it is economically possible.

For the avoidance of odors, the fundamental considerations are the delivery of the sewage as fresh as possible at the plant, the application of the liquid portion to filters before the sewage has become stale, and the proper treatment of the sludge so as to render it comparatively odorless and easily handled.

Disposal plants should be made attractive by planting and parking, and no money can be better spent than this. The trees to some degree prevent the spreading of the odors, and in the planting of trees and shrubs the direction of the prevailing wind should be taken into account.

Local authorities, when they first take up for consideration sewage treatment, frequently look upon the plant as a dump for municipal waste and it never occurs to them that it is good policy to spend money to make the works so attractive that people will voluntarily make it the objective point of their Sunday afternoon strolls. Such beautification and the proper maintenance of the appearance of the plant is the surest and best means of preventing complaints of odors or nuisance; this because of the psychological effect on those living near the plant and also on the attendants, who unconsciously adopt a higher standard of cleanliness and care of the works.

To sum up the whole subject of odors at sewage works: Their prevention depends upon the maintenance of aerobic conditions by cleanliness in the sewers and about the works and by the separation and thorough digestion of the sludge resulting from tank treatment.

And these conditions can be obtained only by skilled operation of both the sewer system and the treatment works.

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JANUARY 7, 1915.

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Municipal Expenditures.

While the various services rendered by municipal officials are by no means to be measured by the amounts of money spent thereon, since some of the most valuable of these involve little or no actual expenditure; still, one of the important features of municipal management is the securing of satisfactory service for a minimum of expenditure, and this is often taken as the chief measure of the success of an administration.

From this point of view that department or function of city government becomes the most important which spends the most money. It therefore becomes of interest to consider what services are receiving the largest percentage of municipal expenditures. The only complete and authentic records of this which we have are those furnished by the Census Bureau relating to cities of 30,000 population or more, and the latest figures published by this bureau apply to the year 1913.

Studying these figures, and considering only the expenditures made for governmental purposes and not those used in redeeming bonds, in payment of state taxes, etc., we find that the total payments of these 199 cities for the year amounted to \$984,141,689. Of the various classifications of expenditures made by the Census Bureau, the largest is that spent for schools and libraries, which are

combined under the head of "education." During the year these cities spent nearly \$199,000,000 under this head, or 20.2 per cent. of the total expenditures.

The other classifications, in their order, were: *Highways* (including bridges, dust prevention and street lighting, as well as pavements), 16.4 per cent. "*Protection of person and property*" (police and fire departments, also militia, registry of deeds, inspection of buildings, elevators, etc.), 12.9 per cent—about 7½ for police, 5 for fire, and a fraction of one per cent for the others. *Water supply*, 10 per cent; but as 45 cities do not own their supplies, the average of those which do becomes 12.9 per cent. *Sanitation*—sewerage, street cleaning, refuse collection and disposal, etc.—7.8 per cent, about one-half of it for sewerage. *Recreation*—parks, playgrounds, baths, museums, etc.—4.6 per cent. *Charities*, including hospitals and corrective institutions, 4.1 per cent. *Health conservation*, 1.3 per cent. Of the remainder, 2.4 per cent was spent by a few cities on gas works and other public service enterprises; 9.2 per cent for general and miscellaneous purposes.

Interest on the public debt took 11.1 per cent on the average, but some cities devoted 26 per cent of their expenditures to paying for the use of money borrowed in previous years, which would certainly indicate an unhealthy financial condition.

Another method of comparing these expenditures, which may be even more interesting, is that of amounts spent per capita of total population. The average amounts spent under the classifications referred to, together with the maximum and minimum amounts spent by any individual cities of the 199, were as follows:

Police, \$2, \$3.35, 53 cents. Fire, \$1.59, \$3.63, 44 cents. All other for protection to person and property, 32 cents, 89 cents, nothing. Conservation of health, 35 cents, \$1.30, 3 cents. Sanitation, \$1.40, \$2.60 13 cents. Highways, \$1.97, \$4.63, 15 cents. Charities, hospitals and corrections, \$1.11, \$3.62, nothing. Recreation, 64 cents, \$2.38, nothing. Water supply and all other public service enterprises, \$1.36, \$6.40, nothing. Interest on the public debt, \$3.63, \$8.26, 41 cents. Schools, \$4.99, \$10.11, \$1.58. Libraries (which are combined with schools under the general head of "education"), 22 cents, 70 cents, nothing.

These figures show which services do, but not necessarily which should, receive the largest expenditures. Some might question whether the highways are really as important as all those activities classed under conservation of health, sanitation, recreation and charities. But they at least indicate how the large cities, taken as a whole, actually distribute their expenditures among these several functions.

Municipal Housekeeping.

The comfort, healthfulness and good reputation of a city, as of a home, depend largely upon the housekeeping; and eternal vigilance in municipal housekeeping is perhaps the most important duty of a city government. Imagine the effect of an entire cessation for one week of the garbage and ash collection and street cleaning throughout an entire city! And a city which half neglects these at all times is certainly not an especially desirable one for residence.

In spite of its importance, however, those duties which come under this head are too often undertaken but halfheartedly, and effectiveness and efficiency in this department receive less serious consideration than in most others. But city officials are waking up to the needs and public demands for clean streets, frequent collection and sanitary disposal of all kinds of refuse without nuisance, and in general for keeping their city in such condition that its citizens can breathe fairly pure air, be offended by no objectionable odors or sights, be unannoyed

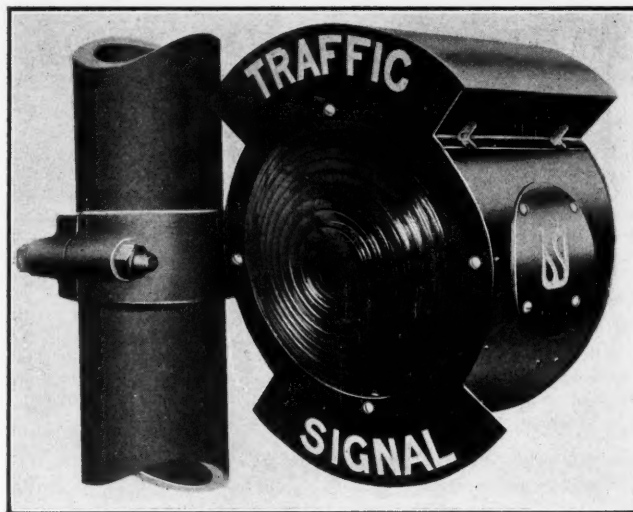
by flies bred in filth or mosquitoes from stagnant pools, and be able to "point with pride" to every section of their city and its surroundings as inviting outsiders to make it their home also.

The day has passed when a self-respecting city turns its political pensioners loose on the streets with hoes and shovels twice a year and calls that street cleaning; entrusts its garbage disposal to uncontrolled collectors who feed it to pigs along the borders of the city, and dumps its ashes and rubbish in unpaved alleys or on the nearest vacant lot. Cities which continue these practices are living in the dark ages.

TRAFFIC SIGNALS FOR PITTSBURGH.

Pittsburgh, Pa., is trying out a new style of traffic signal, the first having been installed on December 30th. Recently a policeman, while acting as "cornerman" (directing street traffic at a street intersection), was killed by a trolley that skidded on slippery rails. Danger of such accidents is especially great in the streets which are too narrow to permit of the cornerman standing in one spot for more than a few moments; and this and the hardship experienced by all of them in severe weather influenced the director of public safety, Chas. S. Hubbard, to experiment with an electric traffic signal.

The one installed as an experiment was placed at the corner of Smithfield street and Sixth avenue, where, it is said, more traffic passes each hour every day than at any other spot in the world. Twenty-six different car lines traverse this crossing day and night. Smithfield street is the direct route from the Pittsburgh & Lake Erie and the Baltimore & Ohio depots to the wholesale district and to the Pennsylvania station. Traffic (except the U. S. mail wagons) runs only one way on Smithfield street—from south to north, the street being narrow; as



SIGNAL AND METHOD OF SUPPORT.

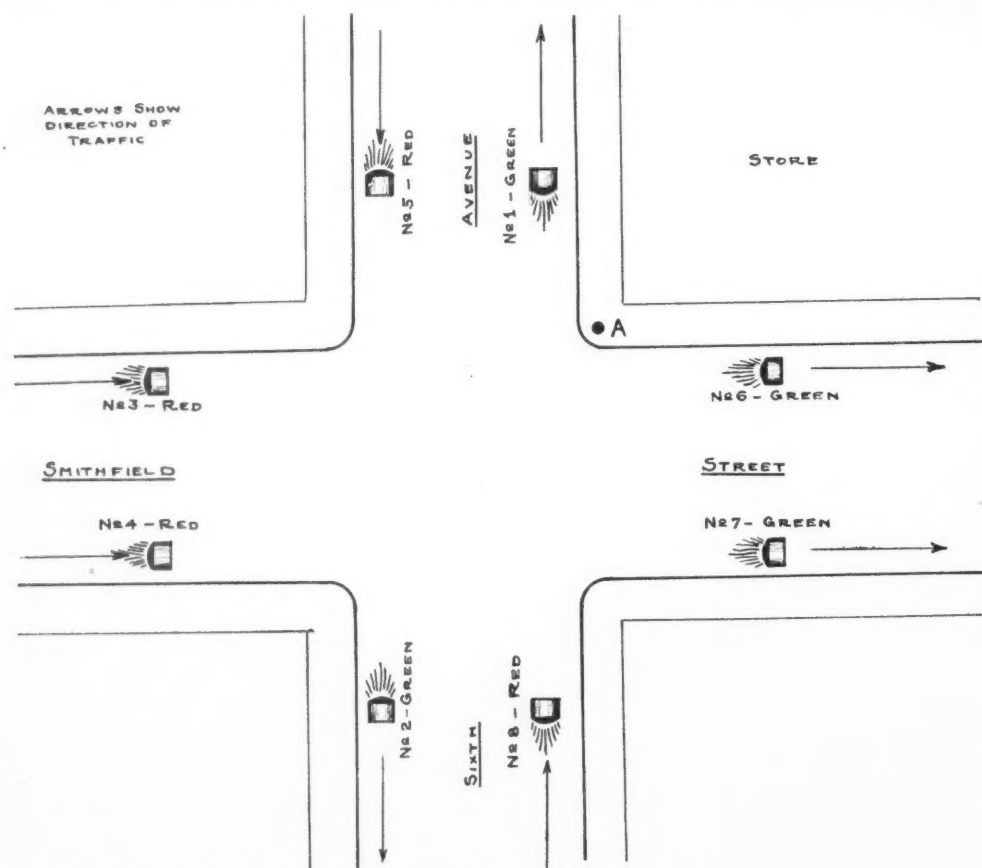
is Sixth avenue also, each being less than 40 feet from curb to curb.

Eight signals are placed at the intersections, in the positions indicated on the accompanying plan. Each signal has a ten-inch red lens to indicate "stop" or a green lens to indicate "start." The cornerman has a lookout station on the pavement, heated by an electric heater, and in his little house has a clear view of the whole crossing and operates the signals from a board in front of him.

CHATTANOOGA'S MUNICIPAL MARKETS.

In an attempt to reduce the cost to the city residents of local and other farm produce, Chattanooga, Tenn., has just opened two municipal markets, the Central and the Southside. The former is in the exact location of the first market house erected in the city many years ago, which was later turned into quarters for the police department and now has again been remodeled. The cost of this remodeling was \$13,310.16. The Southside market was erected at a cost of \$5,000.

The Central market is 254 feet long by 52 feet wide, with a covered promenade at its west front 135 feet long and 20 feet wide, the main structure being set back from Georgia avenue, the west entrance, 135 feet. There is sufficient space on both sides of the promenade for 28 wagons. This space is free and here farm products are sold direct from the producer to the consumer. The entire west wing of the market proper is divided into stalls for the sale of vegetables, meat, fish and game. These stalls are placed along the walls on each side, leaving a wide space in the center. In all there are 28 stalls, varying in length from ten to twenty-one feet, each of which has a private entrance from the outside.



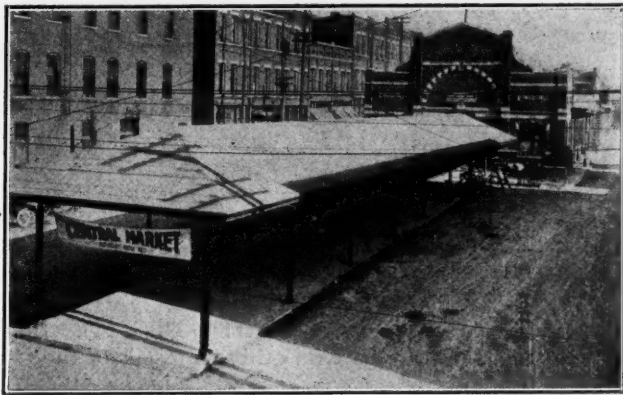
Courtesy Pittsburgh Industrial Development Commission.

DIAGRAM OF TRAFFIC SIGNALS.

Traffic Open on Sixth Ave.—Lamps Nos. 1, 2, 3 and 4 show colors indicated and Nos. 5, 6, 7 and 8 are dark.

Traffic Open on Smithfield St.—Lamps Nos. 5, 6, 7 and 8 show colors indicated and Nos. 1, 2, 3 and 4 are dark.

Traffic officer stands at A, near controller, for operating signals



PROMENADE AND MAIN STRUCTURE, CENTRAL MARKET.

The central pavilion, between the two long wings, contains lunch stands and the market master's desk. On the second floor, above this space, is a rest room for women, where toilet facilities have been provided.

The floors throughout are of reinforced concrete; the walls are plastered with a hard wall coating and the ceilings are covered with metal. Stalls are rented at 50 cents per front foot, but the Commissioner of Public Utilities, Grounds and Buildings has the privilege of raising the charge to 75 cents at the end of six months and to \$1 at the end of a year.

Hugh E. Fry is in charge of the Central market and J. R. Sharp is serving in the same capacity at the Southside market.

Following are the market rules and regulations:

1. Public Market hours shall be from 5:00 A. M. to 7:00 P. M., except Sundays, and in addition 3:00 to 10:00 P. M. on Saturdays.
2. Every person renting space shall provide and keep in use a garbage can, kind and size approved by the market master.
3. The signs used by renters of space shall be of size, kind and in such location as shall be approved by the market master.
4. Smoking or drinking of intoxicants in any market during market hours prohibited.
5. Lounging or loafing in or about the market places is forbidden.
6. Distributing circulars or advertising in any form in the markets except by such signs as renters of space are permitted to use is forbidden.
7. The cleaning or dressing of poultry, fish or any animal in the market place is forbidden.
8. No live poultry or animals will be permitted within the markets. Such poultry or animals, however, may be offered for sale and sold in the streets constituting a part of the market places.
9. No renter of space shall have the right to assign his lease in whole or part, or to sublet any part of such space without the written consent of the commissioner of the Department of Public Utilities, Grounds and Buildings.
10. The city will not be responsible for the loss or theft



VEGETABLE SECTION, CENTRAL MARKET.

of any article of any kind owned or claimed by renters of space.

11. No renter of space in any market will be permitted to keep a telephone within said market.

12. The sale or offering for sale in any market or market place of flesh of calves, pigs or lambs killed when less than 45 days old is forbidden.

13. All persons conducting a business within any market which is subject to a city privilege tax and license shall keep such license posted for inspection.

14. All basket-carriers employed by butchers or other renters of space shall wear badges bearing the same number as the stall at which they are employed.

The Central market was opened on November 16, and the Southside market a few weeks later. The latter is somewhat smaller than the Central market, as it serves a very much smaller community; it is, however, sanitary in all respects and planned along the lines of modern establishments.

USE OF PATENTED ARTICLES.

Court Decisions in the Several States as to Conditions Under Which Cities May Contract for Patented Pavements and Other Articles.

By J. SIMPSON.

Where the power of a city is not restricted by a provision of its charter or statute requiring contracts for municipal improvements to be let to the lowest bidder, there is no doubt that the city may contract for the use of an article which is the subject of a patent or monopoly. Where such charter or statute requires that such contracts shall be let on competitive bids, the prevailing rule now is that such requirement does not preclude the city from contracting for the use of a patented article, or a process controlled by a single individual or corporation. This is the view which is taken in the States of California, Colorado, Idaho, Indiana, Iowa, Kansas, Louisiana, Maryland, Michigan, Missouri, Montana, New Jersey, New York, Ohio, Oklahoma, Oregon, Pennsylvania and South Carolina. Many of the later decisions, however, make this qualification, that the provision requiring competitive bidding is sufficiently complied with if a successful bidder for the contract is able to use the patented article on reasonable terms, which shall be the same to all bidders. The jurisdictions of Illinois and Wisconsin, however, hold that, as the statutory provision intends that there shall be competition in all cases, it is violated by a specification of a patented or monopolized article. In Kentucky a patented pavement or other article may be used if it is brought into competition with a like or equally good material. But even where it has been held that the purchase of a patented article is prevented by a statutory requirement of competitive bidding, this has been limited to cases where the cost of the improvement falls upon the owners of property benefited thereby, and held to have no application to cases where such cost is payable out of the public funds.

The cases illustrating these principles decided prior to 1907 will be found discussed in an article on this subject in *Municipal Journal* of May 29, 1907, Vol. XXII, p. 543. Since that date much litigation has taken place on the question; this article is concerned chiefly with the cases decided during the past seven years.

Idaho. Section 2238 Idaho Rev. Codes, as amended by Laws of 1911, p. 266, vests power in the city council to determine the character and kind of pavement and the material to be used. Under such authority it was held that the council of the city of Coeur d'Alene might adopt bitulithic pavement as a suitable pavement for the improvement described in its ordinances Nos. 344 and 361. Bitulithic pavement, it was said, was only a part of the

cost of the entire improvement. The principle of competition was retained by an agreement filed by the company agreeing to furnish its patented material to all bidders at a flat price of \$1.45 per square yard. The complete cost of the improvement would not only be the cost that was to be paid to the patentees, but would necessarily include additional cost and expenses, such as labor, other materials, tools, machinery, etc., with reference to which there could be the freest competition, and every bidder might compete as a bidder as to the aggregate cost of the improvement. *McEwen v. Coeur d'Alene*, 23 Idaho 746, 132 Pac. 308 (1913).

In *Indiana* it was held, in *Tousey v. Indianapolis*, 175 Ind. 295, 94 N. E. 225 (1911), that a contract may be let for the use of a patented bitulithic pavement, where the patentees openly offer to all bidders and cities within the state the use thereof for the whole year at the reasonable rate of 25 cents a square yard. The court said that here, unlike in the case of *Monaghan v. Indianapolis*, 37 Ind. App. 280 (1905), the patentee had no power, directly or indirectly, to control the award of the contract, for all bidders in the state were placed on equal terms, and no restriction whatever was placed on free competition for the contract. In the latter case, where the patentee reserved to himself the right to decide whether the user was competent to do the work, it was expressly held that the rule there adopted did not exclude the use of a patented pavement, but did exclude the use where the patentee so held the right to use the process as to enable him to designate the contractor. The court distinguished the case of *Seibert v. Indianapolis*, 40 Ind. App. 296, 81 N. E. 99 (1907), where, it is said, the specifications provided that the successful bidder should pay the owner of patented pavements for the use of the patents and certain unpatented materials, a certain sum per square yard of pavement, and the court very properly held that the specification of a particular brand of unpatented material destroyed competition.

In *Kansas* it was held that a statute requiring competitive bidding was not intended to prevent the use of a patented article. *Yarnold v. Lawrence*, 15 Kan. 126 (1875); *State v. Shawnee County*, 57 Kan. 267 (1896); *Bunker v. Hutchinson*, 74 Kan. 651 (1906). Section 1009 of the Kansas General Statutes of 1909 provides that a paving petition shall state the kind of material to be used, but not the brand of material nor the name of the manufacturer thereof. It is held that a petition which used words designating one specific kind of material, patented and controlled by only one company and furnished to bidders at only one price, in effect named the brand of article to be used, and was void. *Pollock v. Kansas City*, 87 Kan. 205, 42 L. R. A. (N. S.) 465, 123 Pac. 985 (1912). Here the price per yard to be charged by the company was \$1.35, and the total price of the paving \$2, leaving, the court said, the margin of possible competition so small as to be negligible.

In *Louisiana* it is held that the fact that a pavement is patented is no obstacle to full and fair competition upon a municipal contract for the laying of it, when the patentee has filed with the city authorities an agreement to let the successful competitor for the contract have the free use of the patent upon payment of a fixed royalty, thereby placing all prospective competitors upon an equal footing; it appearing that the royalty thus exacted was reasonable, and did not destroy the margin of profit under the contract. It was no answer to say that the patentee could underbid his competitors for the contract. *Lacoste v. New Orleans*, 119 La. 469, 44 So. 267 (1907), where the license compensation was 25 cents per square yard. The cases of *Burgess, etc., v. Jefferson*, 21 La. Ann. 143 (1869) and *Asphalt Paving Co. v. Gogreve*, 41 La. Ann. 261

(1889), were distinguished, there being no such agreement filed by the patentee in these cases.

In *Missouri* it is held that where there is a patented article or one held in monopoly which in the eye of the authorities is of such exceptional value and superiority that the public should not be deprived of it, it may be required to be used. *Cleveland Trinidad Paving Co. v. Lord*, 145 Mo. App. 141, 130 S. W. 371 (1910); *Custer v. Springfield*, 167 Mo. App. 354, 151 S. W. 759 (1912); *Rackliffe-Gibson Construction Co. v. Walker*, 170 Mo. App. 69 (1913); *Barber Asphalt Paving Co. v. Kansas City H. P. Brick Co.*, 170 Mo. App. 503 (1913); *Meek v. Chillicothe* (Mo. App.), 167 S. W. 1139 (1914). But it must appear that there are no other materials of the same general character which can be brought into competition. *Taylor v. Schroeder*, 130 Mo. App. 483, 110 S. W. 26 (1908). The Missouri courts are not disposed to extend the doctrine of the above-mentioned cases further than as therein announced; that is, as follows: "If there is a patented article, or an article not patented, but in the hands of one person or company, which article is necessary for the public improvement, and there are no other persons having the same general character of material, which could be brought into competition, the municipality is not forced to use other clearly inferior material, on account of the requirement for competitive bidding." So, a city ordinance and a contract made thereunder requiring the use in street paving of certain brick made by only one company were held invalid; it appearing that there were other bricks on the market which complied with the test established by the board of public works for paving bricks, and which, though differing slightly from the brick selected, were of the same general character, and practically equal thereto.

In *Montana* it is held that a requirement that in the construction of pavement certain patented processes and compounds should be used is valid, the company controlling the patent agreeing that the cost of such material should be the same to all bidders (\$1.50 per square yard), and in other respects the principle of free competition being retained. *Ford v. Great Falls*, 46 Mont. 292 (1912).

The *New Jersey* rule appears to be that a city, acting in good faith, can, in specifications for a pavement, restrict the use of materials to those manufactured by a particular firm, or owned by a patentee. *Milner v. Trenton*, 80 N. J. L. 253, 75 Atl. 939 (1910). But where proposals under a city charter that calls for competitive bidding are purposely so framed that under the circumstances they deter rather than invite bona fide competition, an award to the intentionally favored bidder will be set aside. *Johnson v. Atlantic City*, 82 N. J. L. 204, 81 Atl. 1105 (1911).

New York. It is now provided by the Greater New York Charter, Section 1554, that, except for repairs, no patented pavement shall be laid, or patented article purchased, except under circumstances securing a fair and reasonable opportunity for competition. It is held that if the municipal authorities decide to lay a pavement of a certain general character, complying with the requirements specified by them, the section does not prohibit the owner of a patented pavement complying with the specified requirements, from bidding upon and being awarded the contract, as those able to lay the same character of pavement can enter into competition with the owner of the patented pavement and thus create the condition contemplated by the section. The section, however, prohibits the municipal authorities from advertising for proposals to pave a street with a particular patented pavement, although such authorities have entered into an agreement with the owner of the patented pavement by which the latter has agreed to furnish all bidders with the materials and au-

thority necessary to enable them to lay the patented pavement at a uniform price per square yard (here \$1.49), as no one but the patentee could, under such conditions, lay the pavement without paying the patentee the stipulated price per square yard, thus affording the patentee, if it chose to bid upon the work, an advantage over all other bidders which would effectually eliminate all competition. *Rose v. Low*, 85 N. Y. App. Div. 461 (1903). Where a city indicated three different methods of paving: Method A, a pavement of asphalt of a designated thickness, with a base of Portland cement, concrete, and mortar; method B, a pavement of sheet asphalt with a bituminous concrete binder, and a Portland cement concrete base; method C, patent bitulithic pavement, it was held that this did not afford a fair and reasonable opportunity under this statute, no standard of comparison between the pavements being obtainable by which to determine which was the lowest in price. *Barber Asphalt Co. v. Willcox*, 90 N. Y. App. 245 (1904). Another case on the same contract was decided differently by the Court of Appeals, which held that a contract under such scheme to lay a smooth and noiseless pavement in a city street let to the successful bidder, out of three bidders agreeing to furnish a pavement of the character required, who was the owner of a patented pavement, was a valid contract under the charter. *Warren Bros. Co. v. New York*, 190 N. Y. 297, reversing 119 N. Y. App. Div. 856 (1907). It has since been held that where, because of the steep grade of a road, it was determined to pave a portion thereof with bitulithic pavement or asphalt blocks, designedly omitting smooth pavements, an advertisement for bids on such pavements presented a fair and reasonable opportunity for competition. *Hastings Pavement Co. v. Cromwell*, 67 Misc. (N. Y.) 212, 124 N. Y. Supp. 388 (1910).

In *Ohio* it was held that competitive bidding is not necessarily narrowed, but may be broadened, by admission to the competition of material which is monopolized by reason of patents; and in the exercise of a sound discretion it is competent for the proper city authorities, in advertising for bids for a city improvement, to call for material which is covered, or the assembling of which is covered, by patents. *Holbrook v. Toledo*, 28 Ohio C. C. 284 (1906). And it was held that a contract for paving a street with wood blocks treated with a certain process of coal tar creosote oil would not be enjoined upon the ground that the specifications excluded competition where it appeared (1) that the specifications as to wood blocks were not covered by a certain patented process, but referred to a different and older wood preservative process; and (2) that the pure coal tar creosote oil required might be obtained in the market. *State v. Muller*, 30 Ohio C. C. 460 (1907).

The *Oklahoma* Supreme Court holds the law to be complied with if there is an understanding that the owner of the specified patent will allow the use of his patent and superintend the construction of the work for whomsoever secured the contract. *Reed v. Rockliff-Gibson Const. Co.*, 25 Okla. 633, 107 Pac. 168 (1910). The owner in this case filed an agreement to supply materials and service for 42 cents per square yard.

In *Oregon* it is held in a very recent case, *Johns v. Pendleton*, 66 Or. 182, 46 L. R. A. (N. S.) 990, 133 Pac. 817, 134 Pac. 312 (1913), that the selection of a patented article for a street pavement is not prevented by a charter provision requiring the contract to be let to the lowest bidder if the owner of the patent does not himself bid for the contract, but makes an offer to furnish the machinery for mixing the paving material, or the mixture itself for a stipulated price, on equal terms to all bidders. (Here material and services were offered at 90 cents per square yard.) The court distinguished the facts of the case

from those in the prior case of *Terwilliger Land Co. v. Portland*, 62 Or. 101, 123 Pac. 57 (1912), where it was held that under the Portland city charter, requiring the letting of contracts for public improvements to the lowest responsible bidder, the acts of the council of the city in adopting ordinances for the paving of streets with "Hassam" pavement in such a manner that only the person entitled to use such pavement would bid for the work, and in letting contracts to such person pursuant to his sole bid, were void, and the contracts were illegal. The Hassam Paving Company had copyrighted the trade-name of the pavement, but anybody could use the same ingredients in the same proportions and produce exactly the same pavement without any infringement on the copyright of the Hassam Company; but, as the bids called for Hassam pavement, nobody could submit a bid for such pavement by that name without infringing upon the copyright. If, in that case, the court said, the call for bids had specified the character of the compound desired by requiring it to contain sand, gravel, and cement in the same proportions as contained in the Hassam compound, anyone could have bid. It was a plain case of preferring one contractor as against others possibly having equal facilities for furnishing the identical material.

The *South Carolina* Supreme Court, in *Dillingham v. Spartanburg*, 75 S. C. 549 (1906), followed the Michigan doctrine. The validity of the contract there in question, however, was sustained because there is no statute in the State of South Carolina which compels the city of Spartanburg to submit the matter of street paving to competitive bidding.

In *California, Colorado, Maryland, Michigan, and Pennsylvania* the cases cited in the former article on this subject show that these states allow the use of patented articles.

In *Kentucky* it is held that a patented article may be used in the construction of streets, provided it is brought into competition by the ordinance calling for the improvement with other like or equally as good material for such purposes. In *Fineran v. Central Bitulithic Paving Co.*, 116 Ky. 505, 76 S. W. 415 (1903), a contract was held to be void because, under it, it was indispensable that the patented article should be used. In *Campbell v. Southern Bitulithic Co. (Ky.)*, 106 S. W. 1189 (1908), the ordinance provided for bids for the construction of a pavement out of either vitrified brick or bitulithic pavement. It was held that there was sufficient competition to render valid a contract for bitulithic pavement, even though it was a patented pavement.

Illinois and *Wisconsin* still adhere to the doctrine forbidding the use of patented articles. In *Rossville v. Smith*, 256 Ill. 302 (1912), it was held that a municipal corporation cannot, in an ordinance for a local improvement to be paid for by special assessment, require the use of a patented article not purchasable in the market, or material which can be obtained from only one person, firm, or corporation, even though the owner of the patent or the material agrees to furnish it at a fixed price to any contractor bidding; and although the ordinance does not show, on its face, that the article specified is patented or controlled by a single owner, that fact, if true, may be proved.

In *Stocking v. Warren Brothers Co.*, 134 Wis. 235, 114 N. W. 789 (1907), it was held that a resolution of the common council of the city of Superior directing the improvement of a street with either sandstone blocks, bitulithic macadam, creosote blocks, or vitrified brick, and directing a call for separate bids for the work by the use of each of such materials, did not present opportunity for true competition between all bidders.

The WEEK'S NEWS

State University Highway Course—Congress Reports on Federal Aid—Pavement Ripping in Chicago—Typhoid in South Carolina—Sewer Work in St. Paul—Work on Escondido, Cal., Reservoir—Electrify Pumping Station—Lighting Rates Decision—New Police System for New York—Ruling on Sale of Bonds—New Accounting System for Columbus, O.—Pasadena's Incinerator—Municipal Market in Dallas.

ROADS AND PAVEMENTS

Kentucky State University Highway Course.

Lexington, Ky.—One of the most important adjuncts of the good roads movement in Kentucky is the free two weeks' course in highway engineering which is given each year at State University. More than fifty students were enrolled for the course last January, and it is believed that double that number will attend this winter. The students who attend the course will have the advantage of an interchange of ideas with more than one hundred practical men, besides hearing the lectures of experts and witnessing demonstrations in practical road building and obtaining valuable information in regard to the best road materials and methods of applying them. The cost of road construction and maintenance, information regarding road grading, ditching, spreading of material and the like will enter largely into the course of instruction. The course will be of special value to the students who desire to become road inspectors or contractors.

Among the lectures to be delivered during the course will be a series by Hon. Jesse Taylor, of Jamestown, O., on the subject of "The Need of the State and National Highway System." Mr. Taylor is editor of "Better Roads," and director-general of the National Highway Association. Russell L. Morris, professor of highway engineering in the University of West Virginia, lectures on "Earth Road Construction." "Permanent Bridges" will be the subject of the address of Daniel B. Luten, consulting engineer, Indianapolis, Ind. Dr. L. I. Hewes, United States Government engineer, Washington, D. C., will lecture on "Road Management." "Drainage of Roads" will be discussed by J. F. Grimes, assistant state highway engineer, Frankfort, Ky. Other subjects that will be discussed by prominent speakers will be: "The Construction of the Split-Log Drag," by M. D. Ross, assistant highway engineer, Frankfort, Ky.; "The Relation of the State University to the State of Kentucky," by President Henry S. Barker; "Construction of Waterbound Macadam Roads," by Dr. Hewes; "Construction of Bituminous-Bound Macadam Roads," by Marion D. Moss; "General Methods of Maintenance and Repair," by J. F. Grimes; "Economics of Road Building from an Engineering Standpoint," by Dr. Hewes; "Construction of Brick Roads," by Will P. Blair; "The Testing of Sand, Cement and Concrete," by J. J. Curtis, professor of testing material of State University; "The Farmers' Need of Good Roads," by Dr. Joe H. Kastle, director of the Kentucky Agricultural Experiment Station; "Bond Issues for Improvement," by R. H. Reese; "State Aid," by R. C. Terrell, commissioner of public roads, Frankfort, Ky.; "Culverts and Slab Bridges," Rodman Wiley; "The County Road Engineer and His Duty to the County," Professor Rowe, and "The Future of Highway Engineering," by R. C. Terrell.

Congress Reports on Federal Aid.

Washington, D. C.—The incalculable advantages that would accrue to the United States from the construction of a system of model highways throughout the country are described in the forthcoming report of the joint Congressional committee on federal aid in the construction of post roads. The committee proposes the building of roads equal to European thoroughfares by co-operation of the national government, the states, counties and other local agencies. The committee refrains from recommending any specific plan of action, although it had before it numerous

proposals, varying from outright appropriations of federal funds for road building to former Senator Bourne's bill providing for an issue of fifty-year bonds aggregating \$500,000,000. The principal conclusions presented by the report follow: Congress should proceed at once to devise a broad, comprehensive plan for federal aid to the building of model roads; the supervision of the government's highway building activities should be intrusted to a Congressional commission, not an administrative bureau; care should be exercised that federal aid be scientific and effective and not degenerate into a "pork barrel" raid on the national treasury; first-class roads in this country would reduce the cost of living, improve business and ameliorate educational and social conditions in rural communities. One of the most remarkable features of the report is the argument in favor of committing the supervision of federal aid to road building to a Congressional commission instead of to an administrative bureau. Analyzing the cost of wagon transportation here and abroad the committee finds that "hard surface roads similar to those in France would effect a saving of 13 cents per ton mile, or nearly two-thirds of the present cost. Even if the cost could be reduced 8 cents a ton mile, a saving of \$504,000,000 a year in the cost of American products hauled to market over rural roads could be effected." The social advantages of good roads, the report says, transcend even the business benefits. The committee believes that no other agency will do more in furthering the "back to the farm" movement. That this movement must be promoted is apparent, for "congestion of population in cities is a national evil."

State Road Work in Maryland.

Annapolis, Md.—Work on most of the state roads has been stopped until next spring. During the past year the State Roads Commission has had under contract or completed, including overhead expenses, nearly \$6,000,000 of work out of the \$6,600,000 appropriation made by the last legislature for two years' work. This represents between 400 and 450 miles of road which have either been completed this year or will be next spring. The commission is advertising and letting the remainder of work to be done, and expects to have practically all of it awarded by contract within the next month. The net result of this will mean that the state system, as now mapped out, will be practically completed by the middle of next summer, except as to some spurs and bridges for which the money was not provided by the legislature, and some work in Baltimore city, including the Hanover street bridge.

The average cost per mile of roads built to date, including preliminary surveys and plans, grading, surfacing, bridges and culverts, underdrains, inspection and superintendence and right of way, besides overhead and miscellaneous expenses of every character, was \$10,481 in 1910; \$12,296 in 1911; \$10,833 in 1912, and \$8,286 in 1913, with a general average of \$9,986 for the aggregate of 456 miles finished on the main system proper. The average cost of total maintenance per mile, including oiling, patrol service and all other expenses connected therewith, was \$340 in 1912 and \$434 in 1913. In addition to the state roads proper, the State Roads Commission is, at the same time, constructing a state aid system, in which the state pays 50 per cent of the cost, the county 40 per cent, and the adjacent property owners 10 per cent, the roads being maintained by the county after completion. For this the state appropriates \$300,000 per year, and under it nearly 200 miles of modern road have been built, this forming a valuable adjunct to the state road system.

\$50,000,000 for Michigan State Roads.

Lansing, Mich.—The fifth biennial report of the State Highway Department has been filed by Highway Commissioner Rogers with Governor Ferris. The report tells of the growth and accomplishments of the department in its decade of existence and points out its future needs. Since 1901 the townships of the state have spent \$40,135,897 for roads. The counties have spent \$7,854,907, and the state \$1,950,000 since 1905. The three branches have spent a total of \$49,840,804 in the past thirteen years. This does not include the sum used in 1914. A vast change has taken place in the past year, due to the changes in the law made by the late legislature. On July 1, 1914, 2,336.5 miles of state reward road had been built and accepted by the state. The state also built a number of bridges along "trunk line" roads. The roads were built cheaply and well, the report says, the state saving about half in the cost of material. The law does not authorize the state to repair old bridges and Rogers would like to see this law changed.

Pavement Ripping in Chicago.

Chicago, Ill.—Ten acres of street pavement in the downtown district are torn up every year by public utility companies in making repairs to mains and conduits and in new underground construction work. This was shown in a report made to the City Council Commission on Downtown Improvements by John W. Alvord, C. B. Burdick and L. A. Dumond, who were employed by the commission to make a study of what the city should do to provide underground galleries for mains and conduits. It was brought out in the report that the number of street openings made every year ranges from 2,000 to 4,500, disturbing more than ten acres of pavement in one district. According to the report, installation of underground galleries would mean an increased revenue for the city and an immense saving for the utility companies. The report was adopted by the commission, and steps to carry out its recommendations soon will be taken. If the recommendations in the report are carried out, it said, it would result in the saving of from \$200,000 to \$400,000 annually in the cost of opening pavements.

SEWERAGE AND SANITATION

Typhoid in South Carolina.

Columbia, S. C.—Though only 1,299 cases of typhoid fever were reported for the eleven months of this year, the State Board of Health has estimated in its annual report on that disease that there were at least 6,000 cases in the state. Appended to the report is a statement showing the number of ampules of typhoid bacteria dispensed by the State Board of Health, amounting to 38,746 for the eleven months of 1914, against 25,258 for all of 1913.

Sewer Work in St. Paul.

St. Paul, Minn.—M. N. Goss, commissioner of public works, announces that the city has built 16.67 miles of sewer in the past year at a cost of \$302,814.52. Contracts have been let for about \$200,000 worth in addition, which is now in the process of construction.

The largest sewer construction job completed this season was the Woodlawn-Fairmount system, involving an expenditure of \$83,400. The Maryland-Brainerd system extends for 8,600 feet, and cost \$29,000. Parts of the Perry-Griffith, the Hamline-Jefferson and the Ocean street sewers have been completed. The Hamline-Jefferson system is the largest sewer job now under way, and the largest undertaken this season. It involves an expenditure of \$228,000. The Terry-Griffith sewer system, when finished, will cost \$65,787 and the Ocean street sewer \$45,800. Front and McKenty street sewer, about completed, will cost \$55,000. The city already has planned for the Como-Snelling system, one of the largest sewer projects for the coming year, which, it is estimated, will cost \$300,000. Orders have been prepared for 210 blocks, or about 16 miles of sewer construction.

Expert Proposes Three Sewerage Plans.

Summit, N. J.—Three plans for overcoming the problem caused by the increase of sewage have been suggested to the Common Council by Alexander Potter, under whose direction the joint sewer was built several years ago. Mr. Potter advocated the adoption of Plan B, which provides for an additional storage tank with a capacity of 1,000,000 gallons, together with the addition of a steam turbine centrifugal pump erected in the same pumping plant as that now used, the pump to have the capacity of 1,500,000 gallons a day and to be used only in case of emergency. The cost of such an improvement was estimated by Mr. Potter at \$22,889 and the maintenance charges at \$1,476 yearly. Plan A provided for the construction of an additional force main, the cost of which was estimated at \$25,745 and the yearly expense at \$2,275. The third plan, C, concerns the construction of a relief pumping station, with two electrically driven centrifugal pumps, each with a capacity of 750,000 gallons. For "sentimental" reasons Mr. Potter did not think it advisable to adopt this plan, which he figured would cost \$16,359, with a yearly charge of \$1,803. The report was referred to the committee on sewers and drainage, of which Councilman Knight is chairman.

WATER SUPPLY

Sioux Falls Water Pure.

Sioux Falls, S. D.—That the water supply of Sioux Falls is "practically pure and fit for all domestic purposes," is the report made by Mortimer Herzberg, of Vermillion, director of the state health laboratory; W. E. Daniels, president of the state board of health and medical examiner, who were here recently, and with Dr. G. H. Fulford, county superintendent of health, and C. F. Smith, city plumbing inspector, conducted a thorough examination of conditions along the Sioux River and made an examination of the city's wells. Samples of water from different parts of the river and from the city wells and faucets in the residence and business districts were taken at the time for chemical analysis.

Begin Work on New Reservoir.

Escondido, Cal.—The Holland Construction Co. of San Diego has commenced the excavation for the 1,500,000-gallon storage reservoir of the municipal water system. The contract was secured by the company in competition with a number of other bidders for \$11,494. The John M. Gardiner Co., of Los Angeles, have the contract for the laying of 16 miles of iron pipe for approximately \$55,000. The city has set aside \$5,000 for the purchase of water-bearing lands, upon which it has an option. In these lands the wells will be sunk, and they will also be the site of the pumping station. The distance between the wells and the reservoir is one mile. The bonds for the installation of the water system were voted two years ago, but on account of the condition of the money market they could not be sold at an advantage. Recently the state board of control took a block of about \$75,000. \$25,000 were taken by other parties, so that the entire \$100,000 is now available for the immediate installation of the system.

Electrify Pumping Station.

Spartanburg, S. C.—The city water commission will save about \$600 per year through the new electric pumping plant now being installed at Shoally Creek, according to the estimates of S. A. Bush, superintendent of the waterworks. The entire new machinery for this auxiliary plant has been received, and is now being placed in position. It is expected that the new plant will be all ready for operation by the first of February. The plant will cost, when installed, about \$40,000. It will replace the present steam pumping plant now in operation at the auxiliary station. The new machinery consists of a 100-horsepower motor and a centrifugal pump having a capacity of 1,500,000 gallons in 24 hours, which amounts to practically double the capacity of the old steam plant which it replaces. The electric motor in this new plant will have what is known as

a "remote control," the controlling switch being located at the main plant on Chinquepin Creek. The plant will therefore not require a man at the auxiliary station. Under the present system, the pumping of water at the auxiliary station costs the city about \$14.70 per million gallons. When the new plant is installed this cost will be reduced to about \$10.35 per million gallons. The city of Spartanburg consumes about 1,250,000 gallons of water a day.

Meters Must Be Sealed.

Trenton, N. J.—Holding that it is not only a right but a duty of a water company to seal all meters and to examine and test them whenever necessary, the Board of Public Utility Commissioners has dismissed a complaint against the Lakewood Water, Light and Power Company. Upon the consumer's refusal to permit the company to test his meter and his insistence that it should not be sealed, the company refused to supply him further with water. Service, however, was restored temporarily pending a decision of the board upon the merits of the complaint. Under the rules of the Lakewood company customers desiring to have a metered service are required to pay for the meter. The consumer claimed the meter was, therefore, his property, and that the company had no right to seal it or to remove it for the purpose of testing its accuracy. The board held that the actual ownership of the meter did not affect the company's control over it, the fact that a patron is required to pay for the meter being one affecting only the rates charged for service.

LIGHTING AND POWER

Light Rates Reduced.

Lebanon, Ore.—The Lebanon Light & Power Company has reduced the price on lights for stores, shops and residences from 12 cents to 10 cents per kilowatt, beginning December 1. This is in compliance with a promise to the citizens that when the number of patrons reaches 500 the price will be reduced.

Municipal Plant Lowers Rate.

Two Harbors, Minn.—City council has ordered the rate charged by the municipal lighting plant reduced to 6 cents per kilowatt instead of 8 cents for lighting, as heretofore, and a new rate of 3 cents per kilowatt for power purposes. Those consumers who desire to take advantage of the power rate will be obliged to install a separate meter. The local municipal power plant is a paying proposition and the city officials feel that they can well afford to make the reduction of the rate regardless of the fact that there are still bonds amounting to \$49,000 outstanding against the water and light plant.

Gas Rates to be Reduced.

Jefferson City, Mo.—That the gas and electric rates in Jefferson City will be considerably reduced by the Utility Commission is indicated by the report made to the commission by their expert, Dan McShane. In the inventory filed the company gave the value of their holdings here at \$575,399.62. Mr. McShane gives the total worth of the plant at \$325,459.69, from which he subtracts \$40,682.72 for depreciation. This makes the total value of the plant \$284,776.97. The report further shows that the company made a profit of 16.93 per cent. on the electric business in 1913, and up to August 1 of this year made 13.90 per cent. The profit this year will therefore be considerably more. On their gas plant the company made 8.30 per cent last year and up to August 1 of this year made 6.70 per cent. If the commission adopts the report of Mr. McShane there is no question but that the rates will be considerably reduced in this city. The commission has previously held that a company is not entitled to more than 7 per cent on their investment. The report further shows that the company valued its plant more than double of what the commission expert thinks it is worth.

Lighting Rates Decision.

White Plains, N. Y.—The Public Service Commission of the Second District has decided the complaints of residents of White Plains, Port Chester, Tarrytown and North Tarrytown, Irvington and Eastchester against the Westchester Lighting Company. The opinion is by Commissioner Martin S. Decker. The decision holds that respondent's maximum electricity rate of 15 cents per kilowatt hour in the districts affected is excessive, unreasonable and unjust and for the future should not exceed 12 cents per kilowatt hour, and also that respondent's minimum monthly rate of \$1 is excessive and should be reduced to 75 cents. As to the gas rates in these districts the commission holds that, upon the valuation record as made, the company's income does not afford to it a rate of return which can be reduced by lawful order in these proceedings. But the commission strongly recommends the company to reduce its gas in these districts to \$1.25 per 1,000 cubic feet as a general rate and put in even lower rates in the thickly settled portions of the Port Chester, White Plains and Tarrytown districts. The company's figures of valuation for its gas and electric properties in the Port Chester, Tarrytown and White Plains districts and in Eastchester are \$6,800,000. The commission in determining the amount on which the company was entitled to return reduced this to \$4,300,000. The gas rate in Eastchester is treated separately and it is recommended that some material reduction be made in the Eastchester gas rate. The present rates in the several districts are: Port Chester, \$1.40 per 1,000 cubic feet for light and \$1.25 for fuel; White Plains, \$1.40 for both light and fuel; Tarrytown, \$1.50 for light and \$1.25 for fuel when prompt payment is made; Eastchester, \$1.50 for both light and fuel.

New Jersey Cities Continue Gas Fight.

Trenton, N. J.—At the request of attorneys for thirty New Jersey municipalities, Chancellor Walker reconvened the Court of Errors to hear application for reargument in the 90-cent gas rate decision. The Court of Errors, by reversing the Supreme Court, set aside the order of the Board of Public Utility requiring gas to be sold by the Public Service Gas Company at 90 cents a thousand feet. In granting the request, Chancellor Walker said that it is a case admittedly of great public importance. The cities of Passaic and Paterson are the plaintiffs in the case, but the result of the decision affects Jersey City, Trenton, Hoboken, East Orange, Camden, Milburn, and the residents of twenty other places.

The Court of Errors and Appeals decided to retain the record in the 90-cent gas rate case pending a formal move for a rehearing instead of sending the record down to the Supreme Court. Arguments on the rehearing will be heard shortly. The forces fighting to have the case reopened were formally represented by George L. Record, special counsel for Paterson and Passaic; City Counsel Edward F. Merrey, of Paterson; Dr. Albert O. Miller, of Passaic, and Frank H. Sommer, counsel for the Public Utility Commission. Although without legal standing in the proceedings, Jersey City and Hoboken also were represented, the former by Corporation Attorney John Bentley and the latter by City Counsel John J. Fallon. Hoboken is especially interested in the principal question involved in the pending action—that relative to the valuation or non-valuation of franchises for rate-making purposes—because there is a movement under foot to have the Public Utility Commission order a 3-cent trolley fare rate in Hoboken. Material in support of such an application is now being gathered for the city by experts. If the decision in the gas case should not be altered, the Hoboken trolley proceedings may be seriously affected, if not nullified.

In the meantime, Mayor Seger, of Passaic, will call a meeting of the mayors of all municipalities in the state interested in the subject. The mayors will consider not only this case, but they will unite toward legislation that may be found necessary. Mr. Sommer, in addition, will call a meeting of the legal representatives of all these municipalities, with the object of considering the legal aspect of the pending proceedings.

FIRE AND POLICE

Chelsea, Mass., Gets Help in Fire.

Chelsea, Mass.—Boston, Everett and Revere sent assistance to answer the call of Chief Hudson at a threatening fire in a lumber plant. One fireman was injured, and the loss amounts to about \$150,000.

Chief Resigns After Fire.

Georgetown, S. C.—The burning of half a block in the heart of the residence section here was followed by the tendering of his resignation by Fire Chief Walter H. McDonald, who said that the \$40,000 loss was entirely due to the lack of water pressure at the hydrants. The waterworks are privately owned—by the Black River Water Company. The house of the mayor was among those burned. An investigation by the council is being made.

New Police System for New York.

New York City, N. Y.—Police Commissioner Arthur Woods has announced that he did not intend to restore the fixed post system but that he intended to modify it and install a green light signal system which has been found efficient. The almost instant summoning of a policeman at any time by any citizen will be possible with the new plan, it is said. The new system is to have two patrolmen responsible for a patrol of eight blocks. One is to patrol a single block and the other to patrol seven blocks. The patrolmen are to change places every hour. In that way the commissioner believes everybody will find a policeman when in need of one. On January 1, 1914, there were 1,336 fixed posts in the Greater City. Under the system of green lights, when the patrolman is wanted, a button is pressed at the police station and the green light is flashed on. The light can also be controlled by any citizen by pressing a button at the base of the pole. This system will be extended by a fund of \$30,000 which the commissioner will begin to use the first of next year. Mr. Woods said if he had a sufficient number of men he would like to see the fixed post restored, but that he is doing the best he can with the men at his disposal.

MOTOR VEHICLES

New Triple Pumping Engine.

Bay City, Mich.—The new American-La France triple pump recently purchased by the city for the local fire department has arrived. It is the first of its kind to become part of the motor truck squadron of the fire department, and will be permanently stationed at hose house No. 8.

Buy New Triple Combination.

Goshen, N. Y.—The triple combination pumping engine, chemical engine and hose car motor truck which was ordered by the village trustees from the American-La France Engine Co., of Elmira, for Cataract Engine and Hose Company has arrived. The truck was purchased at a cost of \$7,500.

New Combination in Commission.

San Diego, Cal.—The combination ladder truck for the fire department at the exposition has been put in commission. Superintendent of Fires Percy Benbough announces the delivery of the new pump furnished by the Seagrave company, of Columbus, O. The truck has been given a tryout and is pronounced by Chief Louis Almgren to conform to the specifications.

New Fire Pumper in Service.

Superior, Wis.—The new American-La France combination pumping engine, hose truck and chemical has been accepted and placed in service. It is a 104 h. p. machine and pumps 700 gallons per minute and carries 1,000 feet of 2½ inch hose. It was tested in the presence of Chief Charles Ringer of Minneapolis, Chief John Sharp of Ashland, and Chief Joseph Rendall of Duluth. The apparatus costs \$9,000 and replaces a steamer engine, a combination chemical and hose truck and five horses.

Ogden's New Pumping Engine.

Ogden, Utah.—The new American-La France auto pumper and hose truck, which increases the equipment in the Central fire station to three pieces, has arrived and been tested. It is a 105-h.p. machine carrying 1,200 feet of 2½-inch hose and 100 feet of chemical hose attached to the chemical tank. In the business districts the openings on the fire hydrants have been enlarged for the new engine, which will throw water on top of the tallest of Ogden buildings. There is a smaller valve for connection with the hydrants in the residence district.

GOVERNMENT AND FINANCE

Important Ruling on Sale of Bonds.

Cleveland, O.—Municipal bonds may be sold below par without advertisement of sale, according to a decision by the judges of the court of appeals at Cleveland. The questions involved now affect many municipalities, and are likely to involve many others from time to time. The appeals court decision is final. In 1912 Cleveland issued \$500,000 of electric light bonds. In compliance with the statute they were first tendered to the sinking fund trustees, and by them taken over. In October, 1914, the trustees needed to dispose of some of the assets of the sinking fund. The sale was required to meet maturing obligations. The trustees sought bids for the entire bond issue, not by newspaper advertisement, but by circular letters addressed to various bond and banking houses in Ohio. It was found that the best bid was a joint bid from three Cleveland bond houses, which bid was approximately 98 cents on the dollar. The board awarded the bonds to those companies. Then a taxpayer sued to restrain the board from consummating the sale. The appeals judges decided that the bonds of a municipality, when purchased by the sinking fund trustees, became assets in their hands, and that the title thereto was the same as that to any other bonds purchased by them. The court also ruled that, it being their duty to provide for all maturing obligation of the city, they were empowered by statute to use or sell any of their assets for that purpose, and that in doing so they were not subject to limitations as to price obtained or as to advertising for bids. In the absence of any allegation or showing of bad faith upon the part of the trustees, the court refused to restrain the sale.

Expenditures in Massachusetts Cities.

Boston, Mass.—In a recent compilation of financial statistics of Massachusetts cities the comparative per capita of expenditures of the cities in the state with a population greater than 30,000 are given as follows:

City.	Police.	Fire.	Health.	Sanitation.	Highways.
Boston	3.14	2.22	.80	2.57	2.89
Worcester	1.46	1.62	.42	1.27	3.52
Fall River	1.42	1.40	.41	.90	1.94
Lowell	1.35	1.59	.23	1.06	1.90
Cambridge	1.72	1.33	.52	1.93	3.08
New Bedford	1.69	1.26	.52	1.60	2.34
Springfield	1.71	2.63	.42	1.44	3.39
Lynn	1.17	1.43	.41	1.09	1.87
Lawrence	1.42	1.14	1.30	1.15	1.61
Somerville	1.26	1.19	.45	1.68	2.87
Brockton	1.22	1.58	.33	1.14	1.89
Holyoke	1.30	2.06	.53	.99	1.56
Malden	1.07	1.20	.40	1.29	2.18
Haverhill	1.04	1.22	.32	.83	1.64
Salem	1.23	1.00	.99	.83	1.55
Newton	2.24	1.66	.38	2.08	4.06
Fitchburg	1.12	1.46	.34	.69	2.65
Everett	1.15	1.10	.27	.98	1.54
Pittsfield	1.07	1.05	.21	.66	2.56
Quincy	1.10	1.33	.43	1.16	2.55
Taunton	1.45	1.37	.19	.67	1.43
Chelsea	1.85	1.91	.43	1.08	1.89
Averages	1.46	1.49	.47	1.23	2.29

To Install New Accounting System.

Columbus, O.—The recent order of the state public utilities commission that municipal light plants will have to install the same system of accounting as that imposed by the commission on the privately owned plants will require the establishment of a new system at the municipal light plant here. The council committee on gas and electricity here is

planning that the accounting officer be made one of the chief officers of the plant, with a standing equal that of the superintendent. By following such a course the records of the plant would show at any time the costs of production per kilowatt hour and exactly what factors in the plant were contributing to this cost.

Propose New Charter.

Rockville, Conn.—The proposed new city charter which has been in preparation for a number of weeks by a special committee of members of the city council and other citizens, has been printed and circulated. It has been modeled largely after the charter of the city of Bristol, and is a complete change in every respect from the present charter, which has been in operation since the establishment of the city. It follows largely the commission form of government, and includes the recall of elective officers, initiative, primary elections and referendum. One feature which will probably be generally acceptable is to enlarge and extend the boundary lines of the city, making them the same as the boundaries of the town of Vernon, and to abolish all wards. It is proposed to have the city council consist of the mayor and four councilmen, and the town clerk shall also be the city clerk of the city. The salary list includes \$600 as salary for the mayor and \$100 a year for each concilman, where at present the aldermen and councilmen serve without any pay. The various departments of the city government are to be administered by a commission under the direction and control of the city council.

STREET CLEANING AND REFUSE DISPOSAL

Collecting Schenectady's Garbage.

Schenectady, N. Y.—Deputy Commissioner of Public Works William W. Chadsey in his annual report estimates that the cost of collecting garbage and ashes per family is reported as \$3.08 for the last year, the October statistics showing 21,771 families to be taken care of. At present the reduction plant is turning out a very good product in garbage tannage, claimed to be worth about \$7.50 per ton, but which the city will sell for about \$4.50 per ton. The city invested in its garbage reduction plant \$118,500.

New Incinerator in Operation.

Roanoke, Va.—Roanoke's \$43,000 incinerating plant has made its first run under the direction of City Engineer Giboney. In the presence of the members of the health committee of Council, the plant was given a thorough test. Under an ordinance recently passed by the City Council, garbage hereafter must be separated from ashes, cans, crockery, etc., and the garbage stored in a metallic vessel with a capacity not exceeding ten gallons.

Incinerator Finally Tested.

Coffeyville, Kans.—For the final test of the new municipal incineration plant the carcasses of two horses, six hogs, a dog and three chickens, beside 1,100 pounds of city garbage were burned during a period of three hours. Mayor Curry, the members of the city commission, Prof. C. C. Robbins and several other citizens were present. A tub of white ashes was all that was left of the total consignment of refuse. It required \$2.40 worth of gas to operate the plant during the consuming period.

City Leases Garbage Plant.

Vincennes, Ind.—An ordinance has been passed by which the city leases the garbage reduction plant of the Vincennes Sanitary Company for a period of three years at an annual rental of \$1,500 a year. The first year \$1,000 of the \$1,500 rental is to be used in repairing the plant. The city takes possession on January 1. For several years the city has been paying the owners of the plant for disposing of the city's garbage and it is said the business has proved a profitable one. Mayor House and other city officials believe the city will profit financially under the new arrangement.

Pasadena's Incinerator Successful.

Pasadena, Cal.—In presenting his report for the past month, Public Safety Commissioner W. B. Loughrey says that the garbage incinerator is very successful. Oil to help incineration is being used economically and no nuisances due to odors are being heard. In the inventory of property owned by the city, listed in the annual report of the city auditor, the garbage incinerator is valued at \$53,000. Of this amount the building and plant represents \$36,000, and eight lots comprising the incinerator site are put down as worth \$14,000. R. G. Rogers is superintendent of the plant and the following is his report for operations in November:

Garbage collected by city during month, 157 tons and 1,855 pounds.

Expenses—Salaries, \$542.50; truck, \$22.83; truck monthly tire change, \$20; auto expenses, \$19.51; horse feed, \$60; horse-shoeing, \$3; wagon repairs, \$15.25; total, \$683.09.

Credit, garbage sold, \$34.62. Net expenses, \$648.47; collection, cost per ton, \$4.10.

Incinerator—City garbage incinerated, 157 tons, 1,885 pounds; rubbish, 134 tons 265 pounds; dead animals, one ton 428 pounds; total, 293 tons 578 pounds; less amount sold, 58 tons 1,000 pounds; total incinerated, 234 tons, 1,578 pounds.

Incinerator expenses—Salaries, \$164.50; electricity, \$10.60; water, \$1.95; removal of ashes, \$27; sundries, 60 cents; total, \$204.65; incineration per ton, 87 cents.

MISCELLANEOUS

New Motor Sprinkler Satisfactory.

Pueblo, Colo.—The new motor sprinkler of the street department has been given its first official test by A. W. Olson, street superintendent, and the members of the city commission. The first test of the machine showed that it could be filled and then sprinkle a mile of street on both sides in 12 minutes, or at the rate of five miles per hour.

Contest for City Medal and Flag.

Providence, R. I.—A competition, to which any Providence individual or firm is eligible, will be held by a city council committee to secure suitable designs for the proposed municipal medal and the municipal flag. The medals are for members of the police, fire and other city departments for conspicuous acts of bravery. The municipal flag is desired for use in parades of municipal bodies.

Chicago's South Park.

Chicago, Ill.—The South Park Commission has reported that expenses for 1914, including the completion of improvements, new improvements and running expenses, amounted to \$3,000,000. The completion of the Western avenue boulevard cost \$70,000 and the four other boulevards, paid for by property owners, cost \$825,000.

Cost of Oil Sprinkling.

Newburgh, N. Y.—The cost of the oil sprinkling of the streets during the past summer has been found to be less than originally estimated. Those thoroughfares which were estimated at five cents a running foot actually cost about 2½ cents, while those which were estimated at seven cents will cost 4½ cents. The cost therefore to the householder who owns the average 25 foot lot will vary from about 65 cents to \$1.15. Formerly, for water sprinkling, which was much less satisfactory, the same frontage would be assessed \$3 or more a season.

Municipal Market on Federal Property.

Dallas, Tex.—An ordinance establishing the "Central Open-Air Market" on the site of the proposed Federal building has been adopted by the board of city commissioners. Dallas claims to be the first city in the United States to secure government property for the experiment in reducing the cost of living by direct sale of country produce. Middlemen are barred, only actual producers being allowed to sell on the market. No rental fee will be charged the farmers who use the market. It will be open from 6 A. M. and will close at 9 A. M. on Saturday of each week. The stands will be allotted by the officer in charge of the market. Trade may not be solicited by outcry. Police and sanitary regulations are imposed, and loitering is forbidden.

LEGAL NEWS

A Summary and Notes of Recent Decisions—
Rulings of Interest to Municipalities

Streets and Alleys—Duty to Keep Open.

City of Dayton v. Rhotehamel.—A city need not keep its streets and alleys open, in repair, and free from nuisances, until it opens same to public travel, or otherwise invites the public to use them, although they have been dedicated by the owner and been accepted by the city.—Supreme Court of Ohio, 106 N. E. R. 967.

Diversion of Water—Rights of Riparian Owners.

Stevens v. City of Worcester.—Where a city, which owned land above that of plaintiff, diverts the waters of a brook in which plaintiff had riparian rights, plaintiff is entitled to recover for the damages sustained, unless he had previously parted with his rights, or the diversion was authorized by law.—Supreme Judicial Court of Massachusetts, Worcester, 106 N. E. R. 587.

Rates—Ordinances—Construction.

Economic Gas Co. v. City of Los Angeles et al.—A city ordinance, fixing gas rates and prohibiting the collection, by rebate, drawback, or other device, of a greater or less or different sum than the rates fixed, prohibits a gas company from granting a discount to consumers paying their bills at its office on or before a designated day of the month next succeeding that during which the indebtedness was incurred.—Supreme Court of California, 143 P. R. 717.

Motor Vehicles—Streets—Intersecting Highways.

Manly v. Abernethy.—In Pub. Laws, 1913, c. 107, governing the operation of motor vehicles, the term "intersecting highway," includes the space where one street enters into another, although it does not cross it, since the term "intersect" is defined as either "to cut into or between" or "to cut or cross mutually," and, while the ordinary meaning may be to cross, the danger of accident, which the Legislature was seeking to remove, is as great where the street joins but does not cross, and the former definition should be adopted.—Supreme Court of North Carolina, 83 S. E. R. 343.

Creation of Officer—City Clerk—Ex-Officio.

Standeven v. Gall.—Paterson City Charter, section 12, created the office of Clerk of the Board of Aldermen, and section 26 of the ordinance provided that such clerk should be the executive officer of the Bureau of Vital Statistics and should be known as the Registrar of Vital Statistics. Held, that, though the city clerk by section 25 of the charter is constituted ex-officio Clerk of the Board of Aldermen, he is not for that reason Registrar of Vital Statistics; another person having been duly appointed by the Board of Aldermen as its clerk, who was ipso facto entitled to hold the office of Registrar of Vital Statistics under P. L. 1895, p. 401, providing that the clerk of the board shall be such registrar.—Supreme Court of New Jersey, 92 A. R., 352.

Street Improvements—Repairing—Reconstruction.

Ranney v. City of Cape Girardeau.—Where a gravel street, which had become badly worn so that there were many depressions in it, was graded and macadamized from gutter to gutter with macadam varying in thickness from a few inches to 2½ feet, this amounted to a "reconstruction" of the street, and not to a "repairing" thereof, within Rev. St. 1909, Sec. 9255, providing that no formality shall be required to authorize the repairing of streets, but that the proper officers may, with or without notice, be authorized, by ordinance or resolution, to have such work done, reporting the cost to the council for assessment; and hence, where the provisions of that section, requiring, with regard to the macadamizing of any street, a preliminary resolution declaring the street improvement necessary and a letting of the work to the lowest and best bidder upon plans, etc., were not complied with, special tax bills issued to reimburse the city for the cost of the improvement were void.—St. Louis Court of Appeals, Missouri, 170 S. W. R., 342.

Dedication—Nature—Express Grant.

City of Eugene v. Lowell.—An article of dedication dedicating to public use the streets, alleys, avenues and boulevards in an attached plat, which also shows a block marked by the words "Park Reserved," does not include the park within the terms "streets, alleys, avenues and boulevards."—Supreme Court of Oregon, 143 P. R. 903.

Right of Electric Companies—Due Process of Law—Jurisdiction of Federal Courts.

Ashland Electric Light and Power Co. v. City of Ashland.—An attempt by a city to summarily oust an electric company, which has acquired, by irrevocable grant or contract, the right to maintain its poles and wires in the streets, is an attempt to deprive it of its property without due process of law, in violation of Const. U. S. Amend. 14, and a Federal court has jurisdiction of a suit to enjoin such action.—District Court D, Oregon, 217 F. R., 158.

Obstruction of Stream—Reasonable Use of Water.

Davis v. Town of Harrisonburg.—Where a town owning and operating an electric light plant using water power impounded in reservoirs such water as was required to operate its plant at night during the dry season, and where the plant was reasonably adapted to the normal capacity of the stream, the town was not liable for damages caused thereby to a lower riparian millowner by the lessening of his available water power.—Supreme Court of Appeals of Virginia, 83 S. E. R. 401.

Due Process of Law—Easements—Appropriation.

In re Grand Boulevard and Concourse in City of New York.—Laws 1895, c. 1006, providing that, on the filing of an official map showing a discontinuance of the streets, the abutting owners after six years shall have lost their right to compensation for private easements so appropriated, was unconstitutional, as depriving such owners of their property without due process of law; there being no provision for notice, and the state having no power to shift on the owner the burden of ascertaining that the proceedings had been instituted or that the map had been filed.—Court of Appeals, New York, 106 N. E. R. 631.

Taxpayer's Suit—Right to Relief.

Kasik v. Janssen.—Where the uniforms and equipment of policemen were not paid for out of the public treasury, but they were required to pay for them out of their own means, and in the absence of any statute requiring competitive bidding for the contract of furnishing such uniforms, one not a police officer was not aggrieved, and hence, upon a complaint not showing that the taxpayers of the city would sustain any pecuniary loss by reason of an order of defendant chief of police, requiring policemen to purchase their uniforms of another party, defendant could not maintain a taxpayer's suit to enjoin enforcement of such order, since equity does not interfere with the rules or orders of an administrative officer at the suit of a taxpayer, unless he and his class have sustained or will sustain some pecuniary loss therefrom.—Supreme Court of Wisconsin, 149 N. W. R. 398.

Town Officers—Employment of Person to Perform Duties of Officer.

Daly v. Haight, Town Supervisor et al.—The employment by a town board of a person to perform services usually performed by regularly elected town officers was illegal, though the town board acted in good faith, believing that the employment was legal, and though such person incidentally acted as janitor in attending to fires and keeping the town clerk's office clean; and payment for such services by the supervisor was unlawful, and rendered the supervisor and the person so employed liable for the amount of the payments, as no town officer has a right to employ an assistant at the expense of the town to do any part of the work devolving upon him by virtue of his office, nor has the town board the right to employ such person at the expense of the town.—Supreme Court, Special Term, Westchester Co., 149 N. Y. S., 940.

NEWS OF THE SOCIETIES

Calendar of Meetings.

Jan. 19-21.
AMERICAN WOOD PRESERVERS' ASSOCIATION.—Annual Convention, Congress Hotel and Annex, Chicago, Ill. Secretary-Treasurer, F. G. Angier, care Mt. Royal Station, Baltimore, Md.

Jan. 25-27.
LEAGUE OF WASHINGTON MUNICIPALITIES.—Fifth Annual Convention, Olympia, Wash. Secretary-Treasurer, Dr. Herman D. Brauer, Univ. of Washington, Seattle, Wash.

Jan. 26-28.
WESTERN SOCIETY OF ELECTRICAL INSPECTORS.—Annual meeting, Minneapolis, Minn. Secretary, W. S. Boyd, 76 W. Monroe St., Chicago, Ill.

Feb. 10-17, 1915.
EIGHTH CHICAGO CEMENT SHOW.—Coliseum, Chicago, Ill. Cement Products Exhibition Co., J. P. Beck, General Manager, 208 S. La Salle Street, Chicago, Ill.

May 10-14, 1915.
AMERICAN WATERWORKS ASSOCIATION.—Annual Convention Cincinnati, O. Secretary, J. M. Diven, 47 State street, Troy, N. Y.

June 14-16, 1915.
SOUTHWESTERN WATERWORKS ASSOCIATION.—Annual Convention, Galveston, Tex. Secretary, F. L. Fulkerson, Waco, Tex.

Sept. 20-25, 1915.
INTERNATIONAL ENGINEERING CONGRESS.—Am. Soc. C. E., Am. Inst. Min. E., Am. Soc. Mech. E., Am. Inst. E. E. and Soc. N. A. & M. E., San Francisco, Cal. Secretary, W. A. Catell, Foxcroft Building, San Francisco, Cal.

AMERICAN HIGHWAY ASSOCIATION.

At a meeting of the directors of the American Highway Association held in Washington, the board authorized a committee of two members to meet a like committee from the American Road Builders' Association, these four to choose a fifth member and thus form an executive committee to arrange for the merging of both in an All-American Road Congress at San Francisco in 1915. The two associations named have in their own ranks or immediately identified with them practically all of the recognized official and unofficial good roads workers in the United States and Canada. At the Road Congress recently held in Atlanta, Georgia, by the American Highway Association and its allied organizations, upwards of 4,000 delegates and visitors were registered. At the convention just finished in Chicago there was also a very large attendance. The combining of these two great meetings should result in an attendance of from 7,000 to 10,000.

A legislative committee consisting of Walton Moore of Washington, Charles J. Bennett, state highway commissioner of Connecticut; A. N. Johnson, chief engineer, bureau of municipal research New York City; Francis J. Caffey, Solicitor of the Department of Agriculture, and J. E. Pennybacker, chief of road economics of the U. S. Office of Public Roads, was appointed by the board to co-operate with the U. S. Office of Public Roads, a special committee from the American Bar Association and committees of the various state legislatures in bringing about revision of state road laws. A temporary committee which was appointed last year had already compiled the roads laws of all the states so that the new committee has ready for its use a great mass of material properly in-

dexed and cross referenced. It is probable that the newly constituted committee will first direct its efforts toward outlining legislation covering the establishment and operation of state highway departments and the apportionment of state aid. "A hasty review of state aid in operation convinces me that the most important step is to take the state highway department entirely out of politics," declares Walton Moore, chairman of the committee. "I find," says Mr. Moore, "that the most changes and the most troubles have occurred in those states where the highway departments are subject to political powers and are not conducted as non-partisan technical departments."

Undoubtedly the committee will urge that every state highway department should consist of a non-partisan commission composed partly ex-officio and partly by appointment and that this commission should act in the capacity of a board of trustees for the purpose of appointing a competent state highway engineer and for the further purpose of acting as an intermediary between him and the political branches of the state government. Experience has demonstrated that engineering positions should be filled by appointment rather than election and that the term of service should be as long as good service is rendered. The committee also finds great necessity for the classification of the roads and an apportionment of cost burdens to correspond with the classification. This means that one township should not bear the entire burden of roads which are used by several townships and that one county should not bear the burden of a road that is used by several counties. Varying degrees of traffic call for improvements equally variable in character and cost so that the legislation which will ultimately be found desirable and necessary will apportion to each unit of government its responsibilities, burdens, and benefits. The committee already has a complete compilation of all road laws and will shortly begin its further labors.

Among those who attended the board meeting were James S. Harlan, chairman of the Inter-State Commerce Commission, who presided; Logan Waller Page, director of the U. S. Office of Public Roads; Fairfax Harrison, president of the Southern Railway Company; Richard H. Edmonds, editor of the Manufacturers' Record; L. E. Johnson, President of the Norfolk & Western Railway; James H. MacDonald, former state highway commissioner of Connecticut; S. E. Bradt, secretary of the state highway commission of Illinois; E. J. Mehren, editor of the Engineering Record. The executive secretary, I. S. Pennybacker, and field secretary, Charles P. Light, were reappointed for the ensuing year.

Conference of Montana Municipalities.

The annual conference was held in Billings, Montana, Nov. 16 and 17. W. D. Symmes, mayor of Lewiston, was elected temporary chairman. He appointed as committee on permanent organization Mayors Lease of Great Falls, Smith of Butte and Leavens of Billings. They presented the following report, which was adopted:

"First, we recommend that the name of this organization be the Montana Municipal League.

"Second, we recommend the following permanent officers to be elected at this meeting, for the term of one year: President, vice-president secretary and treasurer, these offices to be combined.

"Third, we recommend that for the purpose of providing revenues for the maintenance of the Montana Municipal League that the various cities be assessed as follows: Cities of first class, \$100; cities of second class, \$50; cities of third class, \$15; towns, \$10.

"Fourth, we recommend that the regular convention be held in Great Falls on December 17 and 18 for the purpose of approving the legislative program.

"Fifth, we recommend that the following committees be appointed at this meeting consisting of five members each: Taxation for municipal purposes; revenues other than taxations (licenses); on special improvement district laws; legislative committee (this committee to consist of three members and to be appointed at the meeting held in Great Falls)."

R. B. Kirkland, city attorney of Lewistown; Clarence Smith mayor of Butte, and W. H. Harmon, city clerk of Great Falls, were named as a committee to prepare a constitution and by-laws.

R. M. Armour, Great Falls; E. F. Allen, Livingston; Alexander Mackel, Butte; A. M. Brandenburg, Bozeman, and M. L. Morris, Great Falls, were named as the legislative committee to draft the bills.

Mayor Robert Leavens of Billings was unanimously chosen president; Alexander Mackel, city attorney of Butte, vice-president, and N. E. Entriken, city clerk of Livingston, secretary-treasurer.

Oklahoma Municipal League.

At the meeting of the league held in Oklahoma City, Okla., E. S. Ratcliff, Mayor of Ada, was elected president, and Charles Lamm, vice-president. Guy Blackwelder, of Oklahoma City, was re-elected secretary, and W. R. Roberts, of Ardmore, treasurer.

Another meeting of the league will be held in the same city Jan. 15, at which time legislative committees will make their recommendations and the recommendations will be placed before the legislature to be in session at that time. The legislative committee is composed of Mayor Duffy, of El Reno; Mayor Stearns, of Shawnee; J. T. Highley, and V. V. Hardcastle, of Oklahoma City.

Montana Municipal League.

The fourth conference of the Montana Municipal League, composed of the officials of the various cities of the state, was held at Great Falls Dec. 17-18. Mayor Leavens of Billings presided over the meetings of the delegates, who numbered more than 50.

Six measures were discussed and reported relative to the advisability of their enactment. One of the resolutions that caused discussion was the proposition for legislation to make property assessment at actual value the rule in Montana. This was not finally disposed of.

Possibly the most important bill given approval was an amendment to the present gambling law. This bill would make subject to prosecution players and dealers alike in card, dice and other games of chance; also those operating bucket shops, and would make the fine from \$100 to \$1,000 and imprisonment from three months to one year. It would also hold proprietors of business places liable for allowing games to be operated.

The league also approved a bill giving city councils power to annex additions without petition, much as public improvement districts are created, putting the burden on those affected by being brought under the municipal limits to oppose rather than apply for it.

Other bills discussed but not yet given formal approval include one regulating speed of autos; for the appointment of park commissioners by the mayor and not the governor; the elimination of municipally owned public utilities from the control of the state public service commission; as to rates, a law governing the condemnation and purchase of property for parks, and a law giving county commissioners the right to help establish libraries for county use so the rural districts may have the benefits of library.

The league named as its legislative committee: C. Oliver Conner, Helena; Thomas Burkin, Lewistown; James L. Wallace, Missoula; N. T. Lease, Great Falls; H. S. Buell, Bozeman, and Robert Leavens of Billings, the last three are present mayors.

Officers were elected as follows: President, Robert Leavens, Billings; first vice-president, Alex Mackel, Butte; second vice-president, I. B. Kirkland, Lewistown; third vice-president, C. E. Hubbard, Great Falls; secretary-treasurer, N. E. Entekin, Livingston.

Montana Institute of Municipal Engineers.

The third annual meeting will be held at Helena, Mont., Jan. 18-20. F. C. Snow, the president, will deliver his annual address, after which will come the committee reports. The following papers will be read:

Publicity and the City Engineer, Henry Gerharz; Force Account or Contract in Municipal Work, W. J. Flood; Is the City Manager or Com-

mission Form of Government Suitable to Montana Cities, C. W. Helmick; Suggestions for Betterment in Marketing Municipal Securities, M. L. Morris; The Improvement District Law in Actual Practice, A. L. Jaqueth; Objects and Use of Testing Bitumens for Paving, Wm. B. Vestal, Jr.; Present Status of the Pollution of Waterways in Montana, Prof. Wm. M. Cobleigh; The Experimental Sewage Plant at Bozeman, C. C. Widener.

International Engineering Congress.

E. M. Dupuy, executive secretary of the International Engineering Congress, announces that though the International Electrical Congress cannot be held, the program of the International Engineering Congress will be carried out as announced some time ago. Additional papers from several foreign countries have been received lately.

Kansas Engineering Society.

The seventh annual meeting of the Kansas Engineering Society will be held at Topeka, Jan. 19-20. A part of the program will be devoted to state highway legislation. The officers of the society are: president, H. A. Rice, Professor of Mechanics, Kansas University; vice-president, T. J. Strickler, engineer for the Kansas Public Utilities Commission; secretary, C. A. Forter, office engineer in the engineering department of the city of Topeka.

PERSONALS

The following officials have been elected in Oregon:

Haines.—A. A. Fidler, W. A. Green, J. F. O'Bryant and E. P. Staples, councilmen.

North Powder.—W. A. Riordan, mayor; C. J. Canon, treasurer; Grant Dalton, W. M. Gilkison and Chris Johnson, councilmen.

John Day.—E. E. Luce, mayor; J. D. Combs, C. M. Cassaday and H. F. Hurberger, councilmen; E. J. Bailey, treasurer; J. N. White, recorder.

West Salem.—George L. Frazure, mayor; F. L. Wood, recorder; George Gosser, Edward Brock, W. S. Fits and John Simon, councilmen.

Gresham.—George W. Stapleton, mayor; D. M. Roberts, recorder; J. H. Metzger, treasurer; James McKinney, marshal; E. H. Kelly, S. S. Thompson and C. M. Zimmerman, councilmen.

Creswell.—C. H. Sedgwick, mayor; C. L. Weber, treasurer.

Echo.—H. D. Smith, mayor; Bert Mullins, E. M. Lissey and Elmer Spike, councilmen.

Pendleton.—James Kyle, mayor.

Bend.—H. A. Miller, mayor; S. C. Caldwell, E. P. Bresterhouse and L. C. Rudow, councilmen; Miss Mary E. Coleman, city treasurer, re-elected.

Beaverton.—George Thyng, mayor; C. H. Fry, recorder; J. L. Hardy, treasurer.

Grants Pass.—E. T. McKinstry, mayor, re-elected; G. P. Jester, treasurer.

Adams.—S. A. Edwards, mayor; A. H. Kirby, treasurer; T. A. Lienallen, recorder; J. W. Perniger, Charles Schatz, S. L. Edwards and A. L. Myrick, councilmen.

The following have been elected in Washington:

Cathlamet.—W. H. Oxman, Bert Sutton, A. S. Babbidge, councilmen; C. H. Warren, city treasurer.

Vader.—E. D. C. Brons, mayor; W. C. Krog, treasurer; Frank Koontz, Charles Riedel and George Wade, councilmen.

Ellensburg.—S. Kreidel, mayor; Mrs. J. W. Nesbit, city treasurer; John Kilmore, W. P. Hiddleston, W. G. Schmid and F. S. Chapin, councilmen; H. W. Hale, city attorney; Rube Crimp, city clerk.

Comas.—Hugh McMaster, mayor; J. D. Currie, attorney; F. B. Barnes, clerk.

Kelso.—C. O. Talbert, mayor; M. J. Lord, clerk; C. C. Bashar, treasurer.

Woodland.—William Strunk, mayor; E. E. Dale, W. J. McKinney and William Schuman, councilmen.

Montesano.—S. S. Morse, mayor; G. W. Gauntlett, clerk; Gaston Moch, treasurer; J. J. Hawley, J. C. McIntyre, E. T. Campion and Roy Conklin, councilmen.

Issaquah.—J. H. Gibson, mayor; P. W. Knoernschild, councilman; Mrs. Mary Burke, treasurer.

Ravensdale.—Thomas Booth, David Weir and George Butula, councilmen; H. McDowell, treasurer.

Pacific.—Joseph Aaron, Silas Ware and Earl Schrenghost, councilmen; Chas. Jenkins, treasurer.

Vancouver.—M. H. Evans, mayor; M. R. Smith, J. J. Padden and John Wineberg, councilmen; Robert Brady, clerk; O. F. Zumsteg, treasurer.

South Bend.—C. A. Coutler, mayor, re-elected; C. H. Mills, city clerk; Herman Murday, city attorney.

Auburn.—C. E. West, mayor; J. R. Knighlinger, T. F. Harris, W. E. Ester and C. J. Kantzer, councilmen; J. F. Lemar, clerk; Mrs. A. A. Corbett, treasurer.

Charleston.—M. M. Bowman, mayor; Wm. Callow, clerk; Lillian Squier, treasurer.

Port Orchard.—Howard Shattuck, mayor; Theodore Hilstad, Robert Close, A. B. Corliss and M. C. Robinson, councilmen.

Renton.—E. J. Hughes, mayor; Grant Bates, clerk; Thomas Dobson, treasurer; Daniel Gaby, attorney; Charles McGowin, John Larkin, Richard Wood and Richard James, councilmen.

Bremerton.—J. C. Baer, mayor; E. J. McCall, clerk; Chas. L. McGill, treasurer; Thomas Stevenson, attorney; Charles Worth, F. W. Carey, George F. Ward and G. W. McGlothen, councilmen.

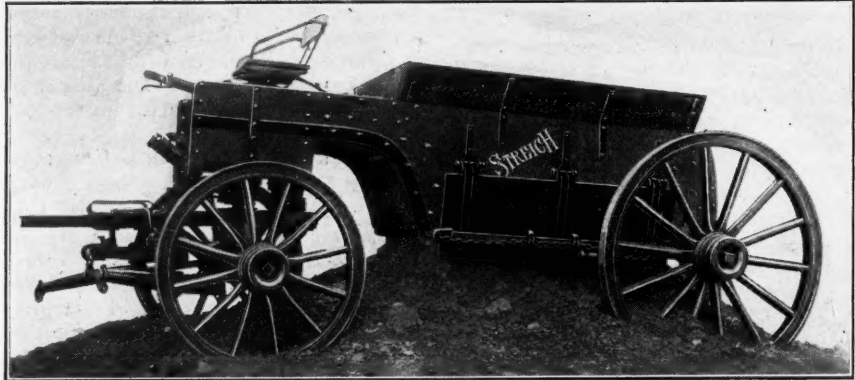
Kent.—M. R. Hardy, mayor; L. E. Price, city clerk, re-elected; Lot Davis, attorney; J. R. Martin, treasurer; F. L. Taylor, H. B. Madison, T. N. Berlin, I. P. Calhoun and W. H. Overlock, councilmen.

(Continued on page 25.)

NEW APPLIANCES

EMERSON TRACTOR.

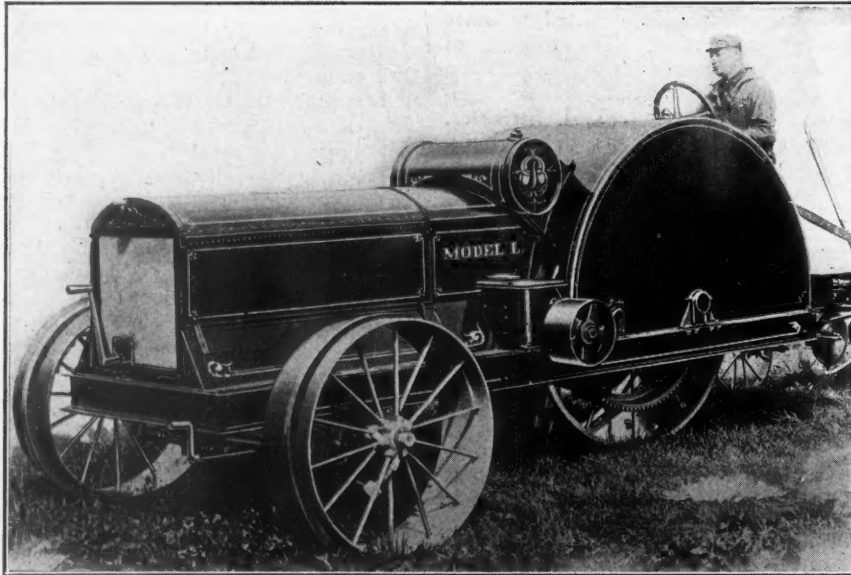
A gasoline tractor adapted to running a small road grader and other small road-building machinery has been designed and is being built by the Emerson-Brantingham Implement Co., Rockford, Ill. The new Emerson Model "L" tractor follows the modern automobile in general design. It is simply constructed and may be run by inexperienced operators. The working parts are made especially accessible. The rated tractive horsepower of the machine is 12-belt horsepower 20. The motor is of the four-cylinder, four-cycle type. A throttling governor makes the gasoline supply practically automatic. The transmission has two speeds forward, both running direct. On low speed the machine is driven at about 1.66 miles per hour and on high



STREICH LIGHT DUMP WAGON.

frame consists of three heavy I-beams resting on the front axle and under-slung from the rear axle. The opera-

type, raybestos-lined. There is a 21x23-inch perfect 9-gallon radiator and an 18-inch fan. The capacity of the gasoline tank is 25 gallons and of the oil reservoir 2½ gallons. A view of the tractor is shown in the accompanying illustration.



EMERSON MODEL L TRACTOR.

at 2.32. The tractor has but one drive wheel, one master pinion, one master gear and no differential—thus saving weight and reducing the cost. The

tor's seat is at the rear. The weight of the tractor is 5,700 pounds.

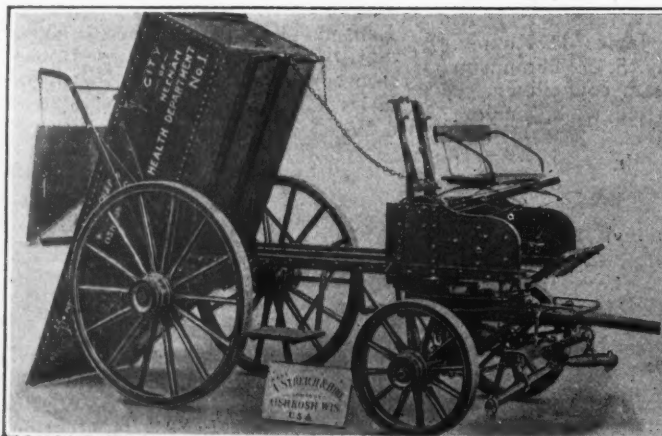
Hyatt roller bearings are used throughout. The clutch is of the cone

DUMP WAGONS.

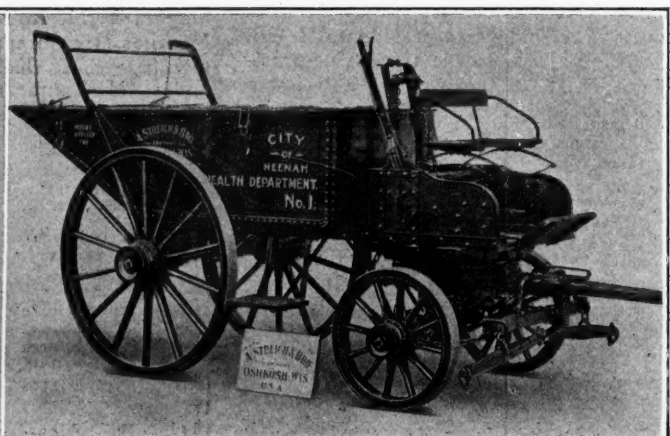
For Garbage Collection and Street Work.

The A. Streich & Bro. Co., Oshkosh Wis., and 663 West Lake street, Chicago, Ill., have added to their line of dump wagons for garbage and street work a lighter wagon, suitable for grading work. The new wagon is equipped with loop hinges, and the weight of the contents automatically forces the bottom door up the sides of the body when the bottoms are dumped, so that the bottom doors offer no obstruction. This type is made in 1, 1½, 2 and 3 cubic yards sizes. The wagon is shown in the accompanying illustration.

The same manufacturers also make steel body garbage wagons for one or two-horse sizes. The bodies are watertight, and the covers tight fitting. The bodies are easily dumped and thrown back into position by a chain and drum operated from the seat. The chain pull



POSITION OF BODY WHEN DUMPED.



STEEL BODY GARBAGE WAGON.

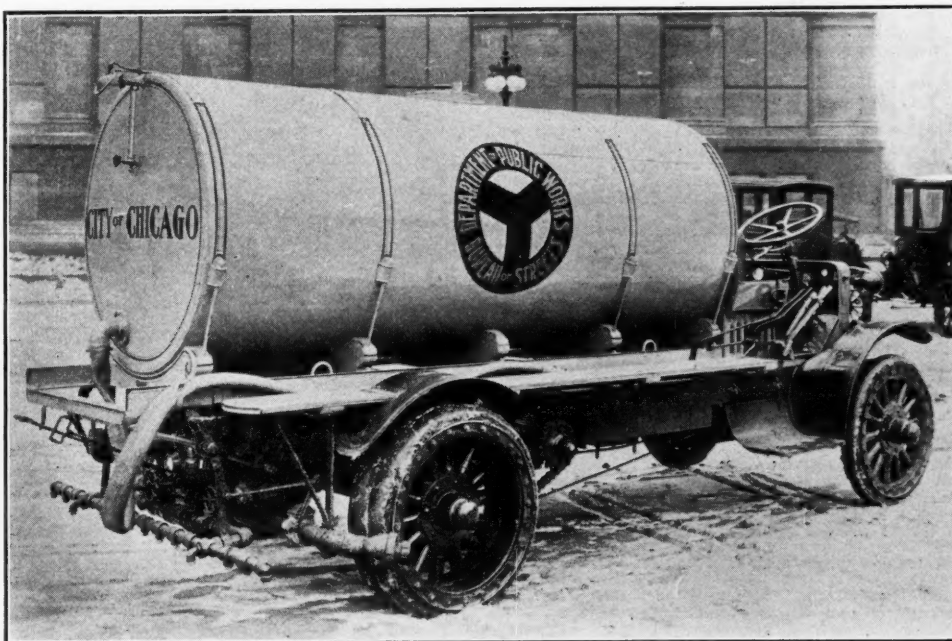
runs the whole length of the box and is positive and actuated by a foot lever while a ratchet hook makes accidental dumping impossible. The wagons are equipped with a patent draft attachment which draws directly from the axle and which is claimed to reduce the draft 30 per cent. The boxes are of double angle steel construction. The wagon, which is illustrated here in normal and dumping position, is made with 2 and 3 cubic yards capacities.

AUTO STREET SPRINKLER AND FLUSHER.

A new street sprinkling and flushing machine has recently been delivered to the street cleaning department of the city of Chicago. The flushing equipment is mounted on a chassis made by the Graman-Bernstein Co., Lima, O., and consists of an 1,100-gallon tank made of heavy steel. The tank contains bulk heads to prevent the sudden shifting of the contents and is equipped with a water gauge to notify

The outfit also includes an oiling system for oiling roads at any desired pressure. A sprinkling device is also furnished when ordered and a self-filling device with which the tank can be filled from streams or other water source with the same pump that discharges the water. The outfits are supplied in various capacities and the nozzles may be located either in the rear, center or front of the machine, and discharging either in the same or opposite directions. A fire hose may be attached to the discharge and the truck used for fire fighting. With a four-inch hose, the tank is filled in one minute and the entire operation of stopping, filling and discharging may be completed in nine minutes. A load, under normal street conditions will serve for six blocks one way and the machine is driven at about seven miles per hour when flushing.

The flushing equipment of the truck, which is here illustrated, was made by E. D. Entyre & Co., Oregon, Ill.



CHICAGO'S AUTO STREET SPRINKLER AND FLUSHER.

the operator when it is filled. If, however, shutting off of the hydrant should be neglected, an overflow forces the water under the machine. The tank is mounted on a sub-frame which rests on the cross-bars of the chassis, so that the tank may be easily removed and the truck used for other purposes.

A special centrifugal pump is mounted on the chassis below the tank and is directly connected to the truck motor. The pump is designed to develop high pressure at low speed so that long life is assured both to pump and motor. Since the connection between the truck and the tank is flexible, the alignment of the pump is not affected by rough roads. The connections from the pump to the flushing nozzles are equipped with controlling valves by means of which the water can be either instantly completely shut off or regulated to any desired pressure.

INDUSTRIAL NEWS

The American-La France Fire Engine Co., Elmira, N. Y., has received the contract for furnishing an automobile aerial truck and renting a combination chemical and hose cart to the fire department of Sioux Falls, S. D.

Cast Iron Pipe.—Chicago—Award of 7,500 tons of small pipe at Chicago was equally divided among the U. S. Cast Iron Pipe & Foundry Co. and the Lynchburg Foundry Co. Bids have been received at Cincinnati for 2,400 tons of 36-inch. In general, the pipe trade is still exceedingly dull. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$23.50; 16-inch and up, \$23. Birmingham—Some encouragement for makers of water pipe. Quotations: 4-inch, \$20; 6-inch and up, \$18. New York—City of Boston will open bids on January 6

for 3,800 tons. Market firmer. Quotations: 6-inch, \$20 to \$20.50.

Lead.—Quotations: New York, \$3.80; St. Louis, \$3.625.

PERSONALS

(Continued from page 23.)

Cogswell, Fred M., has resigned as chief of police of Little Rock, Arkansas. He was a member of the department for 20 years and chief for the past four.

Dolan, Peter H., has been elected chief of the Hamilton Fire Company, Trenton, N. J.

Dunn, Col. John H., it is announced has been reappointed street commissioner of Boston.

Ferber, John, has been elected chief of the Phoebus, Va., fire department. A. A. Schmidt was elected assistant chief.

Hart, Mrs. Thomas F., for the past year policewoman on the Muncie, Ind., force, has resigned on account of ill health.

Imhoff, Dr. Karl, the inventor of the Imhoff tank, has written to Rudolph Hering that he is serving as captain of engineers in the German army. After about six weeks at the front, he was sent to the hospital with an attack of dysentery. In the last six weeks he has been training new battalions near the Holland border. Dr. Spillner, one of Dr. Imhoff's associates, and in charge of chemical work at Essen, was killed in battle. Both of these men are known to many American engineers, especially Dr. Imhoff, who has visited this country several times.

Meier, Col. Edw. D., former president of the American Society of Mechanical Engineers and a well-known engineer, died in New York, Dec. 15, aged 74 years.

Moody, L. Erle, has been chosen as private secretary to Thomas L. Raymond, mayor-elect of Newark, N. J.

Warner, G. A., has resigned as city engineer of York, Pa.

Riblet, C. N., has succeeded W. H. Smith, resigned, as chief of police of Canton, Ohio.

Wotherspoon, Gen. W. W., former chief of staff of the United States Army, has been appointed by Gov.-elect Charles Whitman to the office of State Superintendent of Public Works.

The following lectures were delivered before the graduate students, highway engineering, Columbia University: "Specifications for Sizes and Physical Properties of Broken Stone," by A. W. Dean, Massachusetts State Highway Commission; "The Essential Physical and Chemical Properties of Creosote Oils for Wood Blocks," by S. R. Church, Barrett Mfg. Co., New York; "Details of Construction of American Wood Block Pavements," by A. W. Dow; "European Wood Block Pavements," by George W. Tillson.

ADVANCE CONTRACT NEWS

ADVANCED INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Cal.	Bakersfield	10 a.m., Jan. 9.	11½ miles road	L. L. Miller, Co. Clerk
Ind.	Columbus	1 p.m., Jan. 11.	Macadam road construction	P. J. Slater, Aud. Columbus.
Ind.	Spencer	2 p.m., Jan. 11.	Grading, draining and macadamizing road	P. W. Stwalley, Aud. Owen Co.
Va.	Richmond	Noon, Jan. 11.	Road improvements in Henrico County	State Highway Commission.
Minn.	St. Paul	10 a.m., Jan. 11.	Grading and improving streets	Aug. Hohenstein, Pur. Agt.
Kan.	Anthony	Jan. 11.	Constructing seven sections of roadway	Comrs. Harper County.
Ky.	Louisville	Jan. 11.	Bituminous concrete paving with brick gutters	Board Public Works.
la.	Ottumwa	Jan. 11.	427,142 yds. resurfacing, 13,342 yds. new paving	J. T. Brady, Engineer
Ind.	Columbus	1 p.m., Jan. 11.	Macadam road two miles long	L. W. Sands, Aud. Decatur Co.
Ky.	Louisville	2 p.m., Jan. 11.	Paving with vit. and granite block and bituminous con.	Board Public Works.
O.	Gallion	Jan. 11.	6½ miles of road	Comrs. Richland & Crawford Co.
N. D.	Minot	8 p.m., Jan. 11.	Grading and improving streets	A. D. Hagenstein, City Aud.
Ind.	Plymouth	2 p.m., Jan. 12.	Grading, draining and paving with gravel	G. F. McCoy, Aud. Marshall Co.
Fla.	Bartow	2 p.m., Jan. 12.	1¼ miles sand-oil road construction	J. A. Johnson, Clerk.
O.	Lima	Noon, Jan. 12.	23,000 sq. yds. concrete roadway (readvertised)	Comrs. Allen County.
Ind.	Muncie	2 p.m., Jan. 12.	3,900 ft. gravel road construction	Bd. Comrs. of Del. & Henry Cos.
Mont.	Great Falls	Jan. 12.	Highway work	U. S. Reclamation Service.
O.	Gallion	Noon, Jan. 13.	Macadamizing road	C. C. Higgins, Aud. Morrow Co.
O.	Mt. Gilead	Jan. 13.	Macadamized road construction	C. C. Higgins, Aud. Morrow Co.
Tex.	Belton	10 a.m., Jan. 13.	40 miles of gravel road	Comrs. Court.
Ida.	Bonniers Ferry	Jan. 13.	Road construction	Board County Comrs.
N. Y.	Brooklyn	11 a.m., Jan. 13.	Laying asphalt paving on 5 & 6-in. conc. base, 10 jobs	L. H. Pounds, Boro. Pres.
Minn.	Ada	2 p.m., Jan. 15.	Leveling roads; cost \$4,500	D. E. Fulton, Aud. Norman Co.
Mo.	Edina	Jan. 15.	6 blocks vitrified brick pavement	Frank Gordon, Engr.
Ind.	Franklin	2.30 p.m., Jan. 15.	County line road	H. L. Knox, Co. Aud.
Ind.	Lebanon	1 p.m., Jan. 18.	Grading, draining and graveling road	Bd. of Comrs. of Boone Co.
N. J.	Bridgeton	10 a.m., Jan. 18.	Road improvement, 9.74 miles	Road Committee
Md.	Baltimore	Noon, Jan. 19.	10.56 miles (5 sections) state highway	State Roads Commission
O.	Shaker Heights, Cleveland	Jan. 19.	Curbing, draining and paving streets	C. A. Palmer, Vil. Clk.
P. O.		Noon, Jan. 19.	35,000 sq. yds. paving; 20,000 ft. concrete curb, 12,000 cu. yds. earth excavation	A. D. Stivers, City Engr.
Tex.	Sulphur Springs	Jan. 19.	Concrete sidewalk and curbing for 1915	W. H. Harrison, City Clk.
Mont.	Great Falls	8 p.m., Jan. 19.	71 miles gravel roads	W. A. Crossland, U. S. Senior Highway Engr.
Ind.	Muncie	10 a.m., Jan. 23.	Two miles gravel road	Comrs. of Delaware & Henry Counties.
Ind.	Danville	10 a.m., Jan. 25.	Road improvements	L. W. Borders, Aud. Henricks Co.
Mich.	Flint	Jan. 27.	110,000 sq. yds. of brick, sheet asphalt, asphalt block, bitulithic and wood block pavements	E. C. Shoecraft, City Engr.
Tex.	Greenville	Jan. 27.	Construction of a system of improved highways	Bd. of Permanent Rd. Comrs., Road Dist. 1, Hunt Co.
Ky.	New Albany	Jan. 28.	Street improvement, macadam and granitoid pavements	Board of Public Works.
Ky.	Louisville	Jan. 28.	Paving with bituminous concrete, cost \$8,000	Board Public Works.
Ore.	Bay City	Feb. 4.	Improving streets by grading, paving, curbing and constructing sidewalks, estimated cost \$35,000	City Recorder.
la.	Marshalltown	Feb. 15.	Paving	City Clerk
O.	Upper Sandusky	Mar. 1.	Fifteen miles water bound macadam	J. Megurat, Aud., Wyandotte Co.
SEWERAGE.				
Ind.	Anderson	10 a.m., Jan. 9.	Tile and open ditch construction	W. F. Bronnenberg.
Neb.	Talmage	10 a.m., Jan. 11.	New channels for river	H. Damne, President.
Minn.	Duluth	10 a.m., Jan. 11.	10,825 ft. of 6 to 24-inch vit. pipe; 149 Y's and T's; 102 bbls. cement; 40,000 brick; 32 manhole covers	C. S. Palmer, Clerk.
Minn.	St. James	2 p.m., Jan. 12.	Drainage ditch construction	L. G. Vogel, Aud. Brown Co.
N. J.	Newark	Jan. 12.	Northerly portion Section 18	Passaic Val. Sewerage Comm.
Mass.	Boston	Noon, Jan. 12.	Pipe surface drain and catch basins	L. K. Rourke, Comr. P. W.
Minn.	Ada	2 p.m., Jan. 12.	Drainage ditch construction, cost about \$25,000	D. E. Fulton, Aud. Norman Co.
Ida.	Moscow	8 p.m., Jan. 15.	Sewer construction	City Council
Ill.	Lockport	Jan. 15.	Constructing 8½ miles 8 to 30-inch sewers	Board Local Improvement.
Minn.	Ada	2 p.m., Jan. 15.	Ditch construction	D. E. Fulton, Aud. Norman Co.
Md.	Kensington	8 p.m., Jan. 15.	Construction of sewer system	Mayor and Town Council.
Minn.	Sandstone	8 p.m., Jan. 18.	9,000 ft. 6 to 10-inch sewer, 34 manholes	Chris. Rudisuhle, Co. Rec.
Wash.	No. Yakima	10 a.m., Jan. 18.	Laying 100 ft. of 60-in. reinforced concrete pipe	R. B. Hopper, City Clk.
O.	Shaker Heights, Cleveland	Jan. 19.	Storm and sanitary sewer construction	C. A. Palmer, Vil. Clk.
P. O.		Noon, Jan. 19.	Construction of ditches and diversion channels	J. H. Best, Quincey, Ill.
Ill.	Peoria	9.30 a.m., Jan. 20.	Sanitary work on hospital	Bd. of Trustees, Hosp. Dept.
Mass.	Boston	Noon, Jan. 20.	Street sewer construction	Frank Dietrick, Clk. Vil. Coun.
O.	Ada	Noon, Jan. 21.	Drainage ditch, cost about \$14,750	N. A. Nelson, Co. Aud.
Minn.	Stillwater	Jan. 29.	Main sewer and disposal plant	City Engineer.
Mont.	Roundup	Feb. 1.	Sewer construction	A. P. Perley, Clerk
Ind.	So. Bend	Feb. 1.	Cast iron soil pipe and fittings, sewer pipe and plumbing fixtures	S. McGowan, Paymaster-General, U. S. N.
D. C.	Washington	10 a.m., Feb. 1.	Ten ditches 40,000 ft. long, 8 to 24-inch tile	J. Megurat, Aud. Wyandotte Co.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY.				
O., Napoleon	Noon, Jan. 9.	Water supply and other equipment.....	D. C. Brown, Secy.
O., New Boston	Jan. 11.	Completing distributing system.....	Village Council.
O., New Boston	Jan. 11.	487 tons 4 to 8-inch c. i. pipe.....	T. D. O'Neal, City Clk.
N. Y., New York	2 p.m., Jan. 11.	Cast iron pipe.....	Wm. Williams, Comr.
Ill., Chicago	11 a.m., Jan. 11.	500 tons special castings, 16 to 48 inches in diameter.....	L. E. McGann, Comr. P. S.
Tex., Galveston	11 a.m., Jan. 11.	Repairs to boiler; building cistern.....	J. M. Murch, Co. Aud.
Quebec, Montreal	Jan. 12.	Constructing pumping station.....	Board City Commissioners
N. Y., Yorktown H'ts.	Noon, Jan. 12.	Constructing power house and water supply.....	Wm. Field, 2 W. 45th St., New York City
Mass., Holvoke	2 p.m., Jan. 12.	685 tons 8 to 16-in. cast iron gas pipe.....	John Kirkpatrick, Mgr. Gas & Elec. Dept.
Fla., Clearwater	Jan. 15.	Extensions to water works system.....	R. T. Daniels, City Clk.
Md., Kensington	8 p.m., Jan. 15.	Construction of water system.....	Mayor and Town Council.
Kan., Larned	Jan. 18.	Two motor driven turbine pumps and other equipment.....	L. D. Burgess, City Clk.
Man., Winnipeg	Jan. 18.	Machinery for gravel pit excavation, screening, elevating and crushing machines and locomotives and cars.....	S. H. Reynolds, Chr. of Comm.
O., Shaker Heights, Cleveland	Noon, Jan. 19.	Water mains in streets.....	C. A. Palmer, Vill. Clk.
Ill., Joliet	Feb. 1.	Reservoir construction.....	Henry Odenthal, City Clk.
Greece, Athens	1915, Mar. 30.	Water supply for Athens and additional cities, estimated cost, \$14,000,000.....	Bur. of Foreign & Domestic Commerce, Wash., D. C.
LIGHTING AND POWER.				
O., Napoleon	Noon, Jan. 9.	Power building and electrical plant.....	D. C. Brown, Secretary.
O., Carey	Noon, Jan. 11.	Construction of street lighting system.....	A. J. Frederick, Clerk.
Ill., West Hammond	8 p.m., Jan. 14.	Overhead street lighting equipment.....	I. F. Mankowski, City Clk.
Kan., Topeka	2 p.m., Jan. 16.	Incandescent electric lamps, Mazda and tungsten.....	State Board Control
Kan., Larned	Jan. 18.	Electric light and power plant and water works.....	L. D. Burgess, City Clk.
Mass., Boston	Noon, Jan. 20.	Electric work at hospital.....	Bd. of Trustees, Hosp. Dept.
Ill., Carbondale	2 p.m., Jan. 21.	Power plant for State Normal.....	J. B. Dibbika, 29 S. La Salle St., Chicago.
La., Harrisonburg	Feb. 5.	Concrete dam, cost \$200,000.....	Maj. J. R. Slattery, Box 2, Vicksburg, Miss.
FIRE EQUIPMENT.				
Pa., Hudson	6 p.m., Jan. 11.	Fire escapes for high school.....	R. G. Ayers, Secretary
Ill., Chicago	Noon, Jan. 11.	Fire apparatus for municipal sanitarium.....	Board of Directors
N. J., Atlantic City	Jan. 14.	10,000 ft. of cable, and extensions to fire alarm system.....	W. I. Black, Chief.
Cal., Los Angeles	9 a.m., Jan. 15.	Parts for steam fire engines.....	Chas. L. Wilde, City Clk.
N. Y., New York	10.30 a.m., Jan. 15.	Four motor-driven fuel wagons.....	Robt. Adamson, Comr.
Ill., Chicago	Noon, Jan. 20.	40,000 ft. 1-inch rubber hose.....	South Park Comrs.
Cal., Los Angeles	Jan. 20.	Fire apparatus.....	City Council
BRIDGES.				
Cal., Bakersfield	11 a.m., Jan. 9.	Pile bridges and culverts.....	I. L. Miller, County Clerk
Kan., Washington	Noon, Jan. 9.	One 50-foot bridge.....	Comrs. Washington County.
Kan., Anthony	Noon, Jan. 11.	Eleven concrete bridges from 20 to 300 ft. long.....	R. P. Chevraux, Clk. Co. Com.
Ill., Morrisonville	10 a.m., Jan. 11.	Two reinforced concrete bridges; cost about \$1,650.....	Village Clerk.
Kan., Marysville	Noon, Jan. 11.	Bridges in various townships.....	A. A. Nork, Clk. Marshall Co.
Kan., Marysville	Noon, Jan. 12.	Bridge construction.....	Bd. of Comrs., Marshall Co.
Mont., Great Falls	Jan. 12.	Highway and pipe bridge, two span, 195 ft. long.....	U. S. Reclamation Service.
Neb., Fairmont	Noon, Jan. 12.	Bridges for 1915.....	B. A. Lynn, County Clerk.
Neb., Geneva	Noon, Jan. 12.	Bridge construction for 1915.....	B. A. Lynn, Co. Clk.
Neb., York	Noon, Jan. 12.	Bridge construction in 1915, 15 bridges.....	H. F. Chapin, Co. Clerk
Minn., Breckenridge	Jan. 12.	Ten county bridges, 20 to 26 ft. long.....	P. E. Truax, Aud. Wilkin Co.
Pa., Greensburg	Noon, Jan. 13.	Repairs to bridges.....	John S. Sell, Controller
Neb., Hastings	Jan. 14.	Bridge construction for 1915.....	Co. Bd. Supv.
Minn., Ada	8 p.m., Jan. 15.	27 bridges, 10 large and 30 small culverts.....	D. E. Fulton, Aud. Norman Co.
Minn., St. Paul	Jan. 15.	Reinforced concrete bridges.....	J. Sperry, Pittsburgh Bldg.
Ind., La Porte	Jan. 15.	Bridge construction.....	F. A. Hausheer, Aud. LaPorte Co.
Neb., Wayne	Noon, Jan. 19.	18 to 60-in. corrugated culverts.....	C. W. Reynolds, Clerk.
Ont., Ottawa	Jan. 21.	Substructure of direct lift bridge.....	F. C. Askwith, Act. City Engr.
Neb., Kearney	Jan. 25.	46-foot steel arch bridge.....	City Clerk
Ont., Ottawa	Jan. 28.	Substructure of Pretoria Ave. bridge.....	City Council.
Kan., Salina	Feb. 1.	A \$30,000 conc. bridge over Smoky river at Iron Ave.....	County Commissioners
Kan., Salina	Feb. 1.	Cement bridge over Smoky River (readvertisement).....	J. A. W. Godfrey, Co. Clk.
Minn., Faribault	Feb. 10.	Two bridges and one culvert.....	City Clerk.
MISCELLANEOUS.				
Ind., Muncie	10 a.m., Jan. 9.	Remodelling Orphan's Home.....	Board of Commissioners.
Mass., Boston	11 a.m., Jan. 9.	15 ton locomotive crane.....	H. R. Stanford, Chief Bureau, Navy Yard.
Fla., Jacksonville	8 p.m., Jan. 11.	Removal and disposal of dead animals.....	Committee on Public Works
Mich., Kalamazoo	Noon, Jan. 11.	Collection & removal of ashes, garb. & refuse for 5 yrs.....	C. L. Miller, City Clerk
R. I., Providence	2.15 p.m., Jan. 11.	Installing passenger elevator and building elevator well in city hall.....	Board Contract & Supply.
Wash., Puget Sound	10 a.m., Jan. 12.	One automobile ambulance.....	Bur. of Sup. & Accts., Navy Dept., Washington.
Ky., Louisville	3 p.m., Jan. 12.	Fire-passenger touring car.....	Samual Jones, Dir. Board Ed.
N. Y., New York	3 p.m., Jan. 13.	Repairs and alterations to Harlem hospital.....	Board of Trustees
Ind., Hammond	Jan. 15.	Building city hall.....	Mac Turner, Architect
Conn., Stonington	2 p.m., Jan. 15.	Repairs to breakwater.....	Maj. G. B. Pillsbury, New London.
Ind., Gary	3 p.m., Jan. 15.	Two-story post office.....	O. Wenderoth, Wash., D. C.
O., Cincinnati	Jan. 16.	Six-story court house, cost \$2,500,000.....	Geo. O. Deckebach, Secy.
Okla., Oklahoma City	10 a.m., Jan. 16.	8,000 cu. yds. rock; 4,000 cu. yds. sand; 13,500 bbls. cement and 850 tons reinforcing steel.....	State Capitol Commission.
Mich., Lansing	Jan. 16.	Collection and disposal of garbage.....	John McClelland, City Clk.
N. Y., New York	11 a.m., Jan. 19.	8,000 sq. ft. face cutting of stone for Kensico dam.....	Board of Water Supply
Minn., Minneapolis	3 p.m., Jan. 19.	Remodelling of Custom House.....	O. Wenderoth, Washington, D. C.
Mo., St. Louis	Noon, Jan. 19.	Sprinkling streets.....	Board Public Service.
N. Y., Binghamton	2.30 p.m., Jan. 21.	Boiler and stack at state hospital.....	State Hospital Commission, Albany, N. Y.
D. C., Washington	2 p.m., Jan. 22.	Post Office at Uvalde, Tex.....	O. Wenderoth, Wash., D. C.
Tex., Dallas	10 a.m., Jan. 23.	Furniture for Court House.....	C. E. Gross, Co. Aud.
Neb., McCook	2 p.m., Jan. 26.	U. S. Postoffice.....	O. Wenderoth, Washington, D. C.
Pa., Wilkes-Barre	Noon, Jan. 29.	200 two-way street signs; 400 single street signs.....	City Clerk
Kan., Chanute	Jan. 29.	Construction complete of U. S. Postoffice.....	O. Wenderoth, Washington, D. C.
Fla., Bartow	midnight, Jan. 31.	Construction of city hall.....	City Council.
D. C., Washington	Feb. 1.	Public building, cost \$200,000.....	S. W. Stratton, Dir. Bureau of Standards.

STREETS AND ROADS

Fort Smith, Ark.—Work will commence at early date on building boulevard from Fort Smith Light & Traction Co.'s car barns on both sides of company's car tracks to Fort Smith and Van Buren bridge, a distance of about 2½ miles. It is estimated road will cost between \$8,000 and \$9,000 or about \$3,500 a mile. Road will be built by county.

Alameda, Cal.—Paving of Santa Clara Ave. with asphalt over concrete base is to be ordered in near future, entire cost of improvement, with exception of curbs and gutters, to be paid by city. City engineer and superintendent of streets are now busy preparing plans for curbs and gutters.

Auburn, Cal.—Completion of "wishbone" road with Sacramento at lower end and Tahoe and Tallac at two upper points will be provided for in bill drawn by Senator Birdsall of Auburn which he will present to coming Legislature calling for designation of unfinished portions of road as State Highways. Road, which is uncompleted, is stretch from Auburn, running through Clipper Gap and Colfax to Emigrant Gap. On other fork of wishbone there is another uncompleted stretch between Donner Lake and McKinney.

Fullerton, Cal.—An ordinance calling for special election to vote on proposition of issuing bonds for money with which to improve Brea road to north city limits had its first reading at meeting of Fullerton city trustees. Feb. 10, 1915, is date set for this election. If it carries, city will issue bonds in amount of \$36,000, to run 40 years, using money to make this improvement.

San Francisco, Cal.—Board of works has approved specifications for paving San Bruno Ave. from Oakdale Ave. to Army St. Work will soon be ordered. Board of Supervisors has authorized paving of San Bruno Ave. from Olmstead St. to Railroad Ave.

Santa Ana, Cal.—It is probable that county highway commission will pave Santa Ana canyon road from Olive to Riverside Co. line. The commission has already decided to pave between Olive and Peralta, a distance of about 6 miles. Board of supervisors has been asked to set Jan. 6 as time for receiving bids for building of good roads between Anaheim and Olive. That is last section to be improved under original good roads plan, upon which \$1,270,000 bonds were issued.

Santa Clara, Cal.—Special bond election which was held here for purpose of submitting proposition "Shall town of Santa Clara incur bonded debt of \$30,000 for construction and completion of street improvement for said town," resulted in defeat of proposition.

Vacaville, Cal.—Vacaville has voted in favor of \$30,000 bond issue for street improvements. Of this amount, \$12,000 will be used to pave Main St. and route of state highway through city and \$18,000 will be used for general street work.

Pueblo, Colo.—City is about to commence construction of \$185,000 worth of improvements in Mineral Palace Paving District, consisting of sewer, \$50,000; gravel macadam paving, \$57,000; curb and gutter, \$63,000, and excavation, \$15,000. D. P. Gaymon is City Engineer.

Wilmington, Del.—Proposition to issue \$350,000 in bonds for street improvements instead of spending that amount on park extension is being favorably considered by Councilmen.

Wilmington, Del.—Feeling that public work under way, planned especially for relief of needy unemployed, is not sufficient, Council has agreed to map out at once street-paving plan for next year, with view to starting preliminary grading on several projects as early in year as weather conditions will permit. To cover the cost of this work it is planned to have Legislature authorize bond issue of \$350,000. Several Councilmen say they favor bond issue for street improvements, rather than one for purchase of park lands, as has been proposed through William P. Bancroft's offer to give city land worth \$100,000 if \$350,000 park loan went through.

Danville, Ill.—At meeting of good roads committee, county superintendent received instructions to begin survey of 170 miles of roads to be paved in Vermillion County. Three crews of surveyors, of five men each, will begin work

before end of week. Cost of improvement will reach \$1,500,000, and will be paid for by bonds issued by county.

Waukegan, Ill.—That county of Lake should pass \$500,000 bond issue in spring for purpose of making substantial road improvements all over county is opinion of Charles Russell, superintendent of good roads of county.

Indianapolis, Ind.—Board of Public Works has opened bids for resurfacing Senate Ave., except space occupied by tracks of Indianapolis Traction & Terminal Co., for Indiana Ave. to Tenth St. There was wide variance in bids, which are regarded as low. New surface is to be placed on as much of present foundation as can be used. Low bids were as follows: American Construction Co., using first grade asphalt, \$2.13 a lin. ft. on each side of the street and \$2,735 for streets and alley intersections; Union Asphalt Construction Co., second grade asphalt, \$2.41 a lin. ft. and \$2,360 for street and alley intersections; Republic Construction Co., wood block, \$4.89 a lin. ft. and \$6,000 for street and alley intersections. The American Construction Co. did not bid on second grade asphalt and Republic Construction Co. offered only bid for wood block.

Cedar Falls, Ia.—Council has approved of resolution of necessity for some 47 blocks of new street pavement and instructed mayor to give statutory notice of final consideration of resolution on Jan. 25. New paving district includes upwards of a dozen different streets in various parts of the city from 2d St. to 23d, comprising portions of these two streets as well as portions of 7th, 15th, 6th, 14th, 18th and 11th. The resolution of necessity provides for the reception of bids on three kinds of pavement—asphalt, asphaltic concrete and brick.

Topeka, Kan.—City is planning the paving of various streets. C. B. Burge is city clerk.

Barbourville, Ky.—Circulation of petitions has started, asking vote on March 15 on question of issuing bonds to amount of \$200,000 for construction of good roads in Knox county. Whitley county proposes to hold election to issue bonds to build highway from Corbin to Jellico, on Tennessee border, to connect with Boone highway. By new state law, state joins county in providing funds for road building and this fact materially aids public sentiment in favor of issuing county bonds.

Pineville, Ky.—The Fiscal Court of Bell county, Ky., recently entered order calling road bond election on \$250,000 in bonds, and election will be held on Feb. 13, 1915. Kentucky recently adopted State-aid plan for inter-county road system, and it is expected that this will greatly aid Bell county in this road bond election.

Whitesburg, Ky.—A move is afoot to get model roadway from Winchester to Pound Gap, on Kentucky-Virginia border, the counties of Clark, Powell, Wolfe, Lee, Breathitt, Perry and Letcher, through which model highway is to be built, paying half expense of construction and government the other half.

Baltimore, Md.—Final plans for widening of St. Paul St. from Saratoga to Hamilton St. have been made at special meeting of Board of Estimates and an ordinance will be prepared authorizing the work.

Baltimore, Md.—Bids on repairs to asphalt streets have been opened and bids of present contractors—Baltimore Asphalt Block & Tile Co.—was \$85,510, while the Union Paving Co. bid \$97,018. Bids were referred to City Engineer McCay.

Boston, Mass.—Board of Street Commissioners is planning to construct Dunster Rd., West Roxbury, as a highway, from Centre St. to Pond St. J. J. O'Callaghan is secretary.

Brattleboro, Mass.—Widening of Flat St. has been authorized.

Flint, Mich.—Bids will be received until Jan. 27, 1915, for about 110,000 sq. yds. of pavements. Specifications include brick, sheet asphalt, asphalt block, bitulithic and creosoted wood block. E. C. Shoecraft is city engineer.

Sault Ste Marie, Mich.—Council is considering matter of placing gravel surface on some of streets in eastern part of city and recently asked for estimate of cost, gravel to be purchased on Sugar

Island and hauled across this winter on ice. City Engineer McIlhargie has submitted following estimates for work, surface to be width of 9 ft. and 6 ins. in thickness. Hay Lake Road from Mission St., 3,200 ft., \$944; Mission St., from Portage Ave. to Spruce St., \$340; Spruce St., from Mission St. to Elm St., \$739.50. Gravel will cost from \$1.60 to \$1.70 per cu. yd. in place, depending upon distance of haul.

Chisholm, Minn.—The Chisholm Engineering Co. has finished survey of road to be built from village to north end of Balkan Twp. and construction will commence as soon as weather permits.

St. Paul, Minn.—Council has passed order for grading of alley from Orford to Chatsworth St., between Fairmount and Osceola Aves. Council has ordered grading of Warwick Ave., between Randolph and Palace Sts. at cost of \$1,160.41. Berkeley St., from Prio Ave. to Josephine St., has been ordered paved at cost of \$1,786.70.

St. Paul, Minn.—Preliminary orders for two big paving jobs will be before Council. A date will be fixed for hearing. Paving of Raymond Ave. from University to Carter Ave. is estimated to cost \$76,643.60, or \$7.08 a front foot, for creosoted wood block paving. Raymond Ave. is considered an arterial street. Dayton Ave. from Victoria St. to Lexington Ave. is estimated to cost \$30,217.52 for creosoted wood blocks, or \$6.33 a front foot.

Joplin, Mo.—Two measures for improvement of alleys by paving with concrete have been adopted by City Council. An ordinance was passed for paving of the alley between Joplin and Wall Sts. from 2d to 3d Sts. and the Commissioner of Streets and Public Improvements was authorized to advertise for bids for the work. Resolution was adopted declaring it necessary to pave alley between Wall and Pearl Sts. from 7th to 10th St. Bids may be advertised for this improvement.

St. Joseph, Mo.—Ordinance has been passed for grading of 15th St. from Sycamore to Hickory St.

Hackensack, N. J.—At premium of \$470 and accrued interest, finance committee of Bergen County Board of Freeholders sold entire issue of \$125,000 of 30-year 5 per cent. road improvement bonds to R. M. Grant & Co., New York.

Passaic, N. J.—Ordinance has been passed for laying of asphalt-bound macadam on Bond St., and for construction of concrete curb and gutter. Z. A. Van Houten is City Clerk.

Albany, N. Y.—By order of Public Service Commission, Second District, Eastern Bldy. connecting State and Water Sts. will cross Carthage branch of New York Central on plate girder bridge 67 ft. long and carrying roadway 18 ft. between curb with two 5 ft. sidewalks. Crossing elimination plans call for gravel pavement on bridge and approaches on which state will lay brick pavement in conformity with rest of new street highways.

Auburn, N. Y.—Bonds of city of Auburn aggregating \$43,535.25 were negotiated with firm of A. B. Beach & Co., of New York, by Mayor Charles W. Brister. The bonds were issued on Wall St. and Aurelius Ave. pavement contract, 20 in number, one payable each year. Bid of the New York firm for bonds was \$44,096.86.

Binghamton, N. Y.—Four highways at estimated cost of \$168,700 will be constructed in Broome Co. during next year, according to resolutions which were received by board of supervisors from state department of highways. Plans call for completion of brick pavement on Conklin Ave. from Pierce Creek to city limits, a water bound macadam highway from Chenango Forks to North Fenton, a short strip of concrete highway in village of Windsor and short stretch of macadam highway in village of Union. Pavement on Conklin Ave. will be .91 of a mile long, with estimated cost of \$65,300, of which \$13,526.04 will be paid by state, \$9,345 by county and remainder by city. The Chenango Forks-North Fenton highway is 2.32 miles in length and its cost is estimated at \$30,200. State will pay \$19,630 and county \$10,570. Pavement in Windsor village will be .68 of a mile in length and its cost will be \$14,200, of which state will pay \$9,230 and county \$4,970. Pavement on Main and Nanticoke Sts. in Union will be 1.03 miles in length and construction is esti-

mated at \$59,000. State will pay \$20,085, the county \$10,815, and village \$28,100.

Buffalo, N. Y.—Board of Aldermen has authorized issuance of public works and street improvement bonds in sum of \$31,907.32.

Newfane, N. Y.—At meeting of Newfane Town Board, which was held recently, sum of \$5,857 was appropriated for building of highways during coming year, \$2,928.50 will be given by state beside above sum. Later in month board will decide which highways will receive attention with this sum.

New Paltz, N. Y.—Board of Supervisors has authorized town to issue highway improvement bonds in sum of \$4,000.

Rochester, N. Y.—City at large will pay one-half of expense of widening of Tonawanda St. in accordance with resolution adopted by board of estimate and apportionment.

Sodus, N. Y.—Announcement has been made that state highway department has approved plans for extension of Route No. 30 from Sodus to Wolcott and bids for construction of road will be asked immediately.

Waterloo, N. Y.—Village President Geo. F. Bodine has received bids for \$47,000 of village bonds, for brick paving E. Main St. and part of Washington and River Sts. Lowest bidders were Isaac W. Sherrill & Co., of Poughkeepsie, to whom bonds were awarded.

Watertown, N. Y.—Through the activities of Watertown Chamber of Commerce state highway will be constructed this coming summer from Fargos, a short distance from Carthage, to Natural Bridge, where it will connect with state road which is assured also for next summer from that point on to Harrisville. A preliminary survey has already been made and two roads are listed as No. 4 in Jefferson and Lewis Cos. for 1915 improvement. Roads are but first steps towards state highway into Tupper and Saranac Lakes and the very heart of the Adirondacks.

Coshocton, O.—County Auditor McCullough will proceed with advertising for bids for completion of New Guilford-Walshonding road. Bids are to be opened Jan. 8 at office of state highway department and contract will then be let. Road is to be 12,505 ft. long and will be macadamized. Macadam will be 12 ft. wide and entire roadway 20 ft. in width. Cost of completing construction of road will be about \$5,909.40.

Cincinnati, O.—Resolution has been adopted for improving of Barton St., from Armory Ave. to Wade St., by paving with asphalt; also resolution to improve Morgan St. by paving with brick.

Dayton, O.—Further consideration will be given resolution providing for improvement at earliest possible time of Main St. between bridge and 5th St. at next meeting of City Commission.

Massillon, O.—Plans are in progress to pave State, East Walnut, Clay, North Hill, Cherry and North Mill Sts. and South Lincoln Ave.

Pataskala, O.—Special water works bond election has resulted in victory favoring \$25,000 issue by vote of 91 to 76. Next step will be advertising and sale of bonds and then advertising for construction bids and Pataskala will soon have water works system.

Toledo, O.—The Toledo-Monroe macadamized highway is planned. Estimated cost, \$150,000. Toledo's share of cost of first 7 miles of highway, to be built next year, will be about \$40,000. Amount will have to be raised by private subscription. Entire length of macadamized highway will be 14 miles, so that only half will be built this year. Three and one-half miles will be built southward from Monroe city limits and three and one-half miles north from state line.

Portland, Ore.—One million dollars in 5 per cent road bonds of King Co., Washington, have been sold at Seattle to Lumbermens Trust Co. of Portland.

New Castle, Pa.—In appropriation list for 1915 it was figured that \$10,000 would be spent in repaving streets of city. Following list shows which streets will be paved and estimated cost of paving of each: Clayton St., from Liberty to Cedar Sts., \$1,900; Washington St., from Franklin Ave. to Morton St., \$3,200; Highland Ave., from Lincoln Ave. to Boyles Ave., \$4,900. This is according to estimate prepared by City Engineer Millholland. All this work is merely repaving and not new work.

Shrewsbury, Pa.—Construction work will begin at once on new road projected by residents in this vicinity. It will extend from near Shaw's mill to farm of Mrs. P. A. Diehl, and intersect Stewartstown road in Hopewell Township. Plans for the road were prepared by E. Storms of this borough. McClean Stock and William F. Fry, of York, are viewers appointed by York County Court for new highway.

Williamsport, Pa.—The next two years will undoubtedly bring more paving to Williamsport than has been done in city during past ten years and City Council is already making preliminary plans for work in permanent improvements which will be done next summer.

Bay City, Tex.—County Judge R. R. Lewis will receive bids until Jan. 11 at 10 a. m., for road district No. 6 bonds in sum of \$39,000.

Belton, Tex.—County Auditor W. E. Hall will receive bids until Jan. 13 at 10 a. m., for 40-year road district No. 7 bonds in sum of \$105,000.

Denton, Tex.—See "Miscellaneous."

Floresville, Tex.—Election has resulted by a vote of 122 to 51 in favor of issuing road bonds in sum of \$48,000. W. O. McCracken is County Clerk.

Greenville, Tex.—County Auditor W. M. Henly will receive bids until Jan. 27 for road district No. 1 coupon bonds in sum of \$400,000.

Mission, Tex.—City of Mission, in addition to considerable street improvement in very near future, is advertising for bids on about 18,000 lin. ft. of cement sidewalks, gutters and curbs, cost of which is said to be in neighborhood of \$30,000.

Richmond, Va.—At request of Administrative Board, street committee of the Swansboro Citizens' League has presented Board with plans of league regarding improvements to the streets of this annexed section.

Chehalis, Wash.—Bids have been called to be opened Feb. 1, for 1 mile of concrete road, 16 ft. wide, leading across Sowltz prairie from Toledo. Also for 1 mile and 600 ft. extending from the end of the hard surface pavement southeast of Chehalis, all on the Pacific Highway. The mile on Cowlitz prairie is estimated to cost \$15,149.24, and the section southeast of this city, \$17,420.50.

Superior, Wis.—As part of street improvement program for Superior this coming spring and summer city will pave lower Tower Ave., from 1st to 3d Sts. This has been decided by Commission and will be formally ordered at early meeting. If property owners agree Commission will probably order brick paving for that part of Tower Ave., on account of heavy traffic from bayfront industries. Commissioners favor brick, it is said because of its durability. Job will cost approximately \$10,000. Lower Tower Ave. is 40 ft. wide. Upper Tower Ave. is 60 ft. wide.

Superior, Wis.—City will purchase grader and tractor for street work.

CONTRACTS AWARDED.

Columbiana, Ala.—By Bd. of Revenue of Shelby to Isaac Ellard, at \$8,652.50, for grading and draining state aid road (3 miles), between Vandiver and Dunavant. W. S. Keller is State Highway Engineer.

Montgomery, Ala.—To Isaac Ellard, Birmingham, at \$6,542, for grading and draining two miles of road in Shelby Co.

Sacramento, Cal.—State highway commission has awarded contract to M. R. Construction Co., of Los Angeles, for building state highway between Gallivan and San Juan Creek, in this county. Contract price is \$35,830.80. This contract fills gap between Santa Ana and San Juan Capistrano.

San Francisco, Cal.—By board of works, to Federal Construction Co., contract to improve San Bruno Ave. from Steuben St. to Oakdale Ave., for \$38,658.

St. Augustine, Fla.—By City Council for paving of Cincinnati Ave. with asphalt macadam on concrete base to Seth Perkins & Sons.

Ft. Wayne, Ind.—For constructing Yellow River Rd. No. 2, 18,828 ft., by Bd. County Comrs. to Wilson & Nail, Marion, at \$21,389.

Indianapolis, Ind.—Street improvement contracts have been awarded as follows: Paris Ave., from 25th to 26th Sts., curbing, Charles Schwert; alley east of Washington Blvd., from 30th to 31st Sts., brick pavement, Fisher-Dugan Co.; 28th St., from Burton to Schurmann Ave., curbing and gravel roadway, Frank Lawson; Laurel St., from Minnesota to Iowa St.,

gravel roadway, H. S. Graham & Co.; 28th St., from Burton to Schurmann Ave., cement walks, Frank Lawson; 29th St., from Cornell to McPherson Ave., cement walks, John Arnold; Laurel St., from Minnesota to Iowa St., cement walks, Marion Caldwell; Capitol Ave., from McCarty to Morris St., cement walks, approach walks, curbing and graded lawns, Henry Maag; 40th St., from Senate Ave. to Illinois St., cement walks, and from Senate to Capitol Ave., gravel roadway and curb, A. D. Bowen.

Richmond, Ind.—By Wayne County Commissioners for ½ mile concrete paving in S. 23d St., to T. J. Connell, Milton, Ind. L. Peacock is County Surv.

South Bend, Ind.—For 12 miles road on Lincoln Highway, west section, to J. Ackerman Co., Laporte, Ind., at \$174,600.

Vincennes, Ind.—The Premier Construction Co., of Indianapolis, has been awarded contract for paving Fourth St. in this city with asphalt, contract price being \$52,079.50. L. K. Cooper and H. O. Cooper, of Indianapolis, were representatives of company here. Price is at rate of \$1.69 a yard, and Trinidad Lake asphalt is to be used.

Vincennes, Ind.—The Vincennes Construction Co. has offered lowest bid on concrete when bids for the paving of alley running from Busseron St. to 1st were opened by Board of Works. Their bid was \$1.30 a sq. yd. Frank Jordan bid \$1.65 and Edward Pennington bid \$1.40. The Foulks Construction Co. of Terre Haute had lowest bid on bricks, bricks to be "2ds." Bids was \$1.64 per sq. yd. Frank Jordan bid \$1.80, the Vincennes Construction Co. \$1.77, and Edward Pennington \$1.90. Bids also call for 4-in. curbing on each side.

Baltimore, Md.—Betts & Boice were lowest bidders on construction of section of Baltimore-Annapolis Blvd., running from Glenburne to Pumphrey, which is to be begun in spring by State Roads Commission. Firm's bid were: For macadam, \$39,177; for concrete, \$42,719. For paving of Cathedral St., from Madison to Mount Royal Ave., with sheet asphalt, which also is to be done by State Roads Commission, American Paving & Contracting Co. was lowest bidder at \$22,778.

Baltimore, Md.—To M. J. Beach & Co., contract from Paving Commission for paving Latrobe St., from Lafayette Ave. to Oliver St., at its bid of \$4,518.50.

Boston, Mass.—For bituminous macadam roadway in Intervale St., between Columbia Rd. and Normandy St. (bids opened Dec. 28), to J. C. Coleman & Sons Co., 1620 Tremont St., Roxbury, at \$6,441.90; Martino de Mattio, \$6,540.94; John F. Beatty, \$6,591.73; James Doherty, \$6,643.25; John Landis, \$6,968.83; John Kelly Co., \$7,020.40; Hugh J. McGuire, \$7,398.13; Peter Bompianti Co., \$9,782.15. Engineer's estimate, \$7,467. For excavating and grading Temple St. from Spring St. to Ivory St., and Hillcrest St., from Elgin St. to Temple St., to T. Ross & Son, at \$4,322. Other bids as follows: John C. Kelly Co., \$4,944; J. C. Coleman & Sons Co., \$5,165; M. J. McGuinness, \$5,584; Martino De Mattio, \$5,857; Merrimac Construction Co., \$6,192; E. Perini, \$6,348; Kelley & Sullivan, \$6,380; John Landis, \$6,491; M. De Sisto, \$6,506; Anthony Baruffaldi, \$6,570; Peter Bompianti Co., \$6,684.50; A. Williams & Co., \$6,950; West Roxbury Trap Rock Co., \$7,026; A. M. Cussack, \$7,138.50; Louis Balboni, \$7,370; Antony Cefalo, \$7,400; James Doherty, \$7,558; Thos. F. Minton, \$8,170; John McCourt Co., \$8,482; John P. Cavanagh Co., \$12,410. Engineer's estimate, \$6,452.

Port Huron, Mich.—By Road Comrs. of St. Clair Co. to Port Huron Building Co., at \$11,563.75, for 1½ miles of state trunk line road, class E, on Port Huron & Yale state trunk line.

Joplin, Mo.—E. O. Moats has been awarded contracts for curb and gutter on both sides of Wall St. from C St. to north line of North Heights addition, which is a short distance north of F St.

Atlantic City, N. J.—The Board of Freeholders have awarded to the Atlantic Construction & Supply Co. the contract for construction of proposed Longport-Somers Point Blvd. This same company, of which J. H. Decker is president, submitted lowest bid for work in November, but his figures were \$60,000 less than next highest, and he was allowed to withdraw his bid on plea that he had made an error. Contract was then awarded to Ocean City Bridge Construction Co., but water this action was reconsidered, and all bids were thrown out.

Figures submitted by Decker now are \$182,211, an increase of \$30,000 over November bid. Counsel for Edward Bader Co., next lowest bidder, and for Ocean City Bridge Construction Co., to which contract was awarded, announced that they would apply for writs of certiorari to prevent the award. This means that work will be delayed at least a year.

Brooklyn, N. Y.—The awards of Queens contracts have been made by Borough President Connolly. Successful bidder for repaving roadway and constructing bulkheads in Rockaway Turnpike from New York Ave. to Hook Creek, South Jamaica, was decided to be Public Work Contracting Co. for \$12,130.

How Belts, N. Dak.—To D. C. Smith, Minot, N. Dak., at 10½ cts. per cu. yd., for grading of ½ mile of road and for some concrete work.

Bandon, Ore.—For improving and constructing concrete sidewalk on Oregon Ave. to W. H. Webb, Bandon, at \$11,900.

Aiken, S. C.—To Dyches & Holley, city, at \$11,665, for construction of 15½ miles of sand clay road.

Port Orchard, Wash.—To Nelson & Shoule, city, for grading at about \$10,000.

Seattle, Wash.—By Board of Public Works to S. Normile at \$1,502.70 for paving alley, block 8, Maynard's Plot.

Point Grey, B. C.—To Ledingham & Cooper, at \$23,570, for paving of University Ave.

SEWERAGE

Birmingham, Ala.—Sanitary sewer contracts aggregating over \$15,000 have been authorized by City Commission. The largest contract is in Enon Ridge, where sewers will be constructed to cost over \$12,000.

Los Angeles, Cal.—Ordinances have been adopted for construction of sewers in various streets.

Pueblo, Colo.—See "Streets and Roads."

New Smyrna, Fla.—See "Water Supply."

Indianapolis, Ind.—Resolution for construction of Warman Ave. main sewer has been adopted by Board of Public Works without modification.

Ocean City, Md.—Pugh & Hubbard, Witherspoon Bldg., Philadelphia, Pa., have prepared plans for sewer system and disposal plant. Work will start in the spring.

Grand Rapids, Mich.—Sewage disposal for Grand Rapids was subject of lengthy report presented to Municipal Department of Association of Commerce by special committee, composed of W. K. Clute, Byron T. Gifford and Charles E. Hamilton. Report recommended that city employ expert to study conditions and report best plan with estimate of cost, it being suggested that the Imhoff tank system with possible system of sewage farming to help pay cost may be best suited to this city. Cost is estimated from \$1,500,000 to \$2,000,000. Committee also finds that Grand Rapids has to dispose of daily approximately 12,000,000 gallons of raw sewage and suggests separation of sanitary and storm water ducts in place of combined sewers.

Hibbing, Minn.—Bids for contract for Alice sewer will be advertised as soon as possible. Although condemnation proceedings will have to be started on several lots for right of way, Mayor Power has recommended that village start work as soon as possible to relieve labor situation. Sewers, it is expected, will cost approximately \$50,000.

Mannassquan, N. J.—Borough Council has passed ordinance providing for issuance of water and sewer extension bonds in sum of \$9,000.

Newark, N. J.—Bids have been received by Passaic Valley Sewerage Commission for work on Section 17, Central, of big flume. Section is 5,962 ft. long and extends from E. 43d St. and Boulevard, Paterson, to 6th Ave. and Boulevard, that city. Lowest bid received was that of the New York & New Jersey Construction Co., for \$179,531.

North Wildwood, N. J.—Special election will be held Jan. 12 to vote on question of issuing sewer system extension bonds in sum of \$35,000.

Passaic, N. J.—Eight bids have been received by Passaic Valley Sewerage Commission on central portion of section 17 of trunk sewer. Section is almost 6,000 ft. long and extends from East 43d St. and Boulevard to Sixth Ave. and Boulevard, Paterson. Lowest bidder was the New York & New Jersey Construction Co., of Newark, with \$179,531. Other bidders are: Litchfield Construction Co., Brooklyn, \$211,333.60; Harrison & Craig Co., Newark, \$199,364.10; Merrill, Ruck-

bager Construction Co., New York, \$201,184; Fusco Construction Co., Newark, \$202,441.50; Culp Co., Inc., Brooklyn, \$222,116.16; Cauldwell Wingate Co., New York, \$236,983.30; Arthur MacMullin Co., New York, \$281,492.50. Awards will be made shortly.

Passaic, N. J.—Board of Commissioners has ordered construction of sewer on Howe Ave. to McDonald's brook.

Perth Amboy, N. J.—Ordinance has been passed for laying of 12-in. pipe sewer in Ridgely St., from Jaques St. west.

Trenton, N. J.—Commissioner Fell has received from Herring & Gregory, consulting engineers of New York City, plans and specifications for proposed sewage pumping station and disposal plant. The cost of plant will be about \$400,000. Under present plans the city can take care of sewage until such time as population reaches 150,000. It is expected Commission will set a day to consult with engineers.

New York, N. Y.—Following bids were opened Dec. 23 by President of Bronx Boro. for sewers: Sewer in E. 149th (Bungay) St., E. 144th (St. Joseph) St. Lowest bidder, Peter S. Stanton, 2327 Walton Ave., as follows: 991 lin. ft. concrete sewer, 7 ft. 6 in. x 6 ft. 9½ in., \$30; 220 lin. ft. concrete sewer, 3 ft. 9 in. x 4 ft. 9½ in., \$20; 50 lin. ft. vitr. pipe drain, 12 to 24 in., 50 cts.; 176 spurs for house connections, \$1; 180 lin. ft. risers, \$1; 6 manholes, each \$75; 1 manhole rebuilt, \$60; 5 cu. yds. concrete, Class "A," \$6; 1,125 cu. yds. concrete, Class "B," \$6; 21,000 lbs. steel reinforcement bars, 5 cts.; 30 M ft. timber, \$20; 5 M ft. timber sheeting, \$20; 9,000 lin. ft. piles, 20 cts.; total, \$45,891. Sewers on west side of Aqueduct Ave. (University Ave.), between W. 176th and W. 174th Sts. Lowest bid, Jas. Buckley, 3377 Sedgwick Ave., at \$16,749. Westchester Ave. between Metcalf and Taylor Ave., Westchester Ave. between Metcalf and St. Lawrence Ave., Westchester Ave. between Taylor Ave. and Theriot Ave., Beach Ave. between Westchester Ave. and Randolph Ave. Lowest bidder, F. S. Smith, Westchester Creek and Trumbull Ave., 243 lin. ft. concrete sewer, 40 x 53 in., \$11; 540 lin. ft., 38 x 50 in., \$10; 275 lin. ft., 29 x 40 in., \$7; 523 lin. ft. vitr. pipe sewer, 30 in., \$7.50; 540 lin. ft. 24 in., \$6; 550 lin. ft., 18 in., \$4; 286 lin. ft., 15 in., \$3.50; 1,456 lin. ft., 12 in., \$3.25; 280 lin. ft. basin connections, \$2; 270 spurs for house connections, each \$1.50; 43 manholes, each \$50; 19 receiving basins, each \$150; 600 cu. yds. rock excav., \$2; 950 cu. yds. concrete, Class "A," \$5; 100 cu. yds., Class "B," \$5; 240 cu. yds. concrete, Class "C," \$5; 100 cu. yds. stone ballast, \$1; 39,000 lbs. steel reinforcement bars, .01½ cts.; 24 M ft. timber, \$30; 120 M ft. timber sheeting, \$30; 40,000 lin. ft. piles, 35 cts.; total, \$57,713. Other bids: Amama & Sullivan, 24 E. 198th St., Bronx, \$59,848; Wm. A. Mitchell, \$62,730; Marrone Constr. Co., Westchester, \$63,769.

Patchogue, L. I., N. Y.—Sewer bonds in sum of \$3,500 have been sold to Patchogue Bank.

Coshocton, O.—Resolution providing for construction of sewage disposal plant on John Hoop farm below Roscoe at cost of not to exceed \$50,000 is also ready for passage, but will probably be held over until first Council meeting in January, owing to fact that plans and estimates of Chester & Fleming, of Pittsburg, had not yet arrived.

Massillon, O.—Plans are in progress for revision of city sewer system.

Washington, O.—Resolution has been adopted declaring it necessary to construct, maintain and operate main sanitary sewer No. 13, in subdivision No. 1 of Lucas County, Ohio, Main Sewer District No. 4, in Washington Township, Lucas County.

Portland, Ore.—Proposals have been again received by Council for construction of Willow and East 82d St. branch of East Stark St. district sewer. Proposal of Guthrie-McDougall Co., based on reinforced concrete construction amounting to \$168,907, was the lowest or approximately \$4,000 less than lowest bid offered by Giebisch & Joplin, three weeks ago, which was rejected. Bid of Guthrie-McDougall Co., based on monolithic construction, was \$182,658. Other bids received were: William Lind, \$173,080; Montague-O'Reilly Co., \$169,637 for reinforced concrete and \$178,891 for monolithic; J. F. Shea, \$174,545 for reinforced concrete, and \$185,664 for monolithic; Giebisch & Joplin, \$173,399 for re-

inforced concrete and \$184,076 for monolithic; James Kennedy Construction Co., \$173,549. Bids were referred to Commissioner Dieck for tabulation and report.

Allentown, Pa.—City Council has completed first definite step leading to construction of long awaited sanitary sewerage system, when it ratified an agreement with Franklin Koehler for purchase of his farm north of this city. When City Engineer Charles D. Weirbach, in collaboration with Hering & Fuller, consulting engineers, of New York, in March, 1908, submitted to council report on sewerage city they recommended acquisition of part of Mr. Koehler's farm as most feasible and economical site for location of sewerage disposal plant.

Erie, Pa.—Ordinance has been passed providing for construction of 9-in. diameter lateral sanitary sewer in Reed St., in city of Erie, extending from 21st St. south 200 ft. more or less, together with necessary house connections. M. J. Henry is clerk.

Denton, Tex.—See "Miscellaneous."

Ogden, Utah.—City has ordered sewer improvement in district No. 123, which is on Jackson Ave., between 20th and 21st Sts.

Richmond, Va.—City Engineer Bolling has been directed by Administrative Board to execute contracts between city and Burton Marye and Saville & Claiborne, aggregating about \$55,000, to continue work on Shockoe Creek sewer, between Lombardy St. and Spottswood Ave.

Parkersburg, W. Va.—Resolution has been introduced in City Council for bond issue of \$200,000, to be used in construction of streets, sewers, etc.

Sheboygan, Wis.—Construction of 15-in. vitrified pipe sewer in Lincoln Ave. has been ordered.

Superior, Wis.—City Commission has adopted resolution introduced by C. N. O'Hare, authorizing and directing issue of \$32,000 in general sewers bonds for construction of main sewers in Superior. Resolution was formally passed to prepare for financing of sewer construction work to be done in Superior this winter. City is planning construction of sewers costing approximately \$50,000.

Hamilton, Ont., Can.—City will vote on question of issuing sewer bonds in sum of \$305,000.

Watford, Ont., Can.—Special election will be held to vote on question of issuing drainage bonds in sum of \$5,000.

CONTRACTS AWARDED.

Blytheville, Ark.—By city, to A. C. Brooks of Birmingham, at about \$54,200, to construct sewers.

Indianapolis, Ind.—Contract has been awarded to George W. Schauer for sewer in Massachusetts Ave., Brightwood, with branches in Adams and Olney Sts. This sewer is to be completed by March 1. The Columbia Construction Co. has been awarded contract for local sewer in Lansing St., from Market to Court Sts., to be completed by Jan. 30.

Baltimore, Md.—Contract for constructing lateral sewers in Northeast Baltimore for Sewerage Commission has been awarded to firm of Ryan & Reilly on its bid of \$81,515.50. Bids on contract for construction of additional section of Jones Falls interceptor have been opened and referred to Sewerage Commission for tabulation.

Boston, Mass.—For Fanuel Valley Brook conduit, in Faneuil and Oakland Sts., Brighton, to the Henry Spinach Contracting Co., Waterbury, Conn., at \$16,584.50. Other bids as follows: Anthony Cefalo, \$16,661.10; John Landis, \$17,193.65; McCarthy & Walsh, \$17,297.45; Michele De Sisto, \$17,390.77; James J. Conway, \$17,391; West Roxbury Trap Rock Co., \$17,567.25; M. H. Kelley, \$17,962.40; James Driscoll & Son Co., \$17,978.55; Merrimac Construction Co., \$18,149.45; Anthony Baruffaldi, \$18,445.77; Wm. L. Dolan, \$18,979.45; John McCourt Co., \$22,539.50. Engineer's estimate, \$18,498.90. For pipe sewers and drains in Cypress St. and Baker St., West Roxbury, to Anthony Cefalo, Montgomery, at \$2,897.60, other bids as follows: Michele De Sisto, \$2,924.67; James Driscoll & Son Co., \$2,960.05; James J. Conway, \$3,756.50; Anthony Baruffaldi, \$3,809.90; Martino De Matteo, \$3,857.82; Balboni, Louis, \$3,909; West Roxbury Trap Rock Co., \$4,005; A. M. Cusack, \$4,464.15; Charles A. Kelley, \$4,637.60. For pipe sewers and drains in Everett street, from Olney street to point 342 feet southeasterly, Dorchester to A. E. Doddario, at \$1,394.85. Other bids as follows: Anthony Cefalo, \$1,441.50;

Timothy Coughlin, \$1,606.05; M. H. Kelley, \$1,697.15; Louis Balboni, \$1,893.50; Martino De Matteo, \$1,903.30; George J. Regan, \$1,944.50; R. Cartullo, \$2,320.40; Peter Bompiani Co., \$2,407.97; Anthony Baruffaldi, \$3,380.30. For building catch basins in South Boston and North Dorchester, to M. H. Kelley, at \$1,116. Other bids as follows: Peter Bompiani Co., \$1,309.50; Louis Balboni, \$1,546; Anthony Baruffaldi, \$1,634.11; George J. Regan, \$1,662.20.

Westfield, Mass.—Selectmen have opened bids for 10,000 ft. of sewer pipe, 6 to 24 ins. in diameter. This pipe will be used in connection with sewer work next summer. There were two firms whose bids were the same. Selectmen awarded the contract to Cecil C. Gamwell of Pittsfield. Cost of the pipe will approximate \$2,500. Bids were as follows: Cecil C. Gamwell of Pittsfield, 79 per cent off list price; H. Wales Lines Co. of Meriden, Conn., 79 per cent off; Fiske & Co. of Boston, 78 per cent off; Portland Stone and Ware Co. of Boston, 78½ per cent off; Warner Miller Co. of New Haven, Conn., 77½ per cent off; Eastern Clay Goods Co. of Boston, 75 per cent off and 2 per cent additional for payment within 15 days; John W. Ramsay of Boston, 77½ per cent off; David W. Lewis Co. of Boston, 78½ per cent off and 2 per cent additional for payment in 15 days; T. Shea of Springfield, 77 per cent off; Waldo Bros. of Boston, 77 per cent off; Mosely & Maschin of Westfield, 76½ per cent off and 2 per cent additional for payment in 30 days.

Pasausic, N. J.—The Union Building & Contracting Co. has been awarded contract for sanitary sewer in Howe and Van Houten Aves., and De Vogel Contracting Co. contract for storm water sewer in Central Ave.

Ithaca, N. Y.—Contract for installation of new machinery at sewer pump station has been let to Jamieson-McKinney Co. on bid of \$563, the lowest of seven bidders.

Canton, O.—For construction of main sewer to sewage disposal plant, all three sections were awarded to J. F. Casey Co., Pittsburgh, Pa., on American Sewer Pipe Company's 39-in. segment block with concrete siphons, brick manholes and brick blow-out chambers. For Section 1 contract price was \$49,657.43; contract 2, \$52,511.16, and contract 3, \$73,812.07.

Allentown, Pa.—To Frank Connor, 522 Tilghman St., at \$15,995.72, for 970 ft. sewer in 14th ward. Jos. A. Schmidt is City Clerk.

Philadelphia, Pa.—For reconstruction of Mantua Creek main sewer, to Joseph Perara, 334 North 65th street, at \$12,400. Also for branch sewer on Price street, to Richard Bennis, 710 E. Cheltenham avenue, at \$2,600. G. S. Webster is chief engineer and surveyor.

Oconomowoc, Wis.—To Waukesha Sewer Constr. Co., Waukesha, Wis., for 1,400 ft. 12-in. sewer and 6 manholes.

Superior, Wis.—At meeting of Board of Public Works contract was let to Frosserom & Mattson for construction of sewer between Norwood and Maple Sts. from Gates to Raspberry Aves. in Central Park. Frosserom & Mattson were low bidders of three that filed bids. Low bid was \$1,075.

WATER SUPPLY

San Diego, Cal.—The electors of San Diego will probably vote on proposition to purchase Volcan water system at regular spring election to be held in April. Proposition carries with it voting \$1,000,000 in bonds as first payment. Purchase price is to be \$2,500,000, the additional \$1,500,000 to be expended by Henshaw in construction and not to be paid by city until expiration of forty years, if so desired.

San Diego, Cal.—Bond brokers of San Francisco have bought \$1,000,000 of San Diego water bonds issued to John D. Spreckels as part payment for Southern California Mountain water system, according to City Treasurer Don M. Stewart.

New Smyrna, Fla.—Special election to vote on question of issuing \$63,000 in bonds for purpose of installing systems of water works and sewers and funding present indebtedness of city of New Smyrna, has been called for Jan. 12.

Muscataine, Ia.—With view of cutting down water waste in Muscatine local

water works contemplates installation of 500 meters during coming year.

Pretty Prairie, Kan.—A bond election to vote \$17,000 for Municipal water works plant, has been called for Jan. 18, at Pretty Prairie. Engineer who prepared plans and estimates reported that this sum is sufficient to give town a water system, with hydrants for fire protection. It is not intended to put in pumping plant, but to make lease with owner of local electric light plant who will do the pumping.

Laurel, Md.—Bids will be received in January for extension or distributing system, filtration plant and sewage disposal works, from plans of Harry Stevens, of Washington, D. C. Total cost is \$50,000.

Westfield, Mass.—The special act authorizing water department to expend sum not exceeding \$200,000 for new storage reservoir in connection with Granville system is being prepared by Town Attorney Harold E. Howard, and will be presented to Legislature by Representative Thomas J. Cooley. It is not planned to expend that sum, but it is probable that if a storage basin is built it will cost from \$140,000 to \$160,000.

Westfield, Mass.—Special water supply committee will prepare statement to be published in the annual town reports. Site of proposed reservoir for Granville system will be at junction of Tiltison and Hollister brooks and special act for legislative authority for borrowing not more than \$200,000 for work is being prepared and will be presented to Legislature by Representative Thomas J. Cooley.

Gilbert, Minn.—One of beneficial results of recent Supreme Court decision which permits Gilbert to annex contiguous mining territory, thereby increasing taxable wealth of village, will be installation of new water supply. Two plans are under consideration. One is to pipe supply from Ely Lake and other is to sink deep well.

Hibbing, Minn.—Only a small unit of a hypochlorite plant to serve temporary needs at Scranton mine water supply will be installed. This plant will only be in service until wells at Alice are completed, which it is expected will be next summer some time.

Hibbing, Minn.—Following recommendation of state board of health that village construct a hypochlorite plant at Scranton mine to purify the drinking water, the water and light board has endorsed construction of plant and will push work with all possible speed.

Billings, Mont.—Water bonds in sum of \$450,000 have been sold to Weil-Roth & Co., of Cincinnati.

Harlowton, Mont.—Town Clerk S. K. Campbell will receive bids until Jan. 21 at 8 p. m. for water works extension coupon bonds in sum of \$15,000.

Camden, N. J.—Mayor Ellis recommends drawing of plans for auxiliary water system for property along the river.

Perth Amboy, N. J.—Water Improvement bonds in sum of \$100,000 have been awarded to A. B. Leach & Co., and John D. Everitt & Co.

Perth Amboy, N. J.—Steps for immediate sinking of 12 more artesian wells at Runyon watershed have been taken at meeting of Board of Water Commissioners.

Carthage, N. Y.—It is now being very seriously considered by Carthage and West Carthage putting in about 50 ft. of water pipe under state bridge in State St. to connect water systems of two villages.

Clyde, N. Y.—Mr. Smith, of Boston, representing the Clyde Water Works, has called upon Dr. W. R. Vrooman, president of village, and other prominent citizens, and submitted for their consideration, to be later presented to taxpayers, the proposition to purchase the Clyde water works.

Schenectady, N. Y.—Ordinances have been approved for laying of water mains in streets of newly annexed section and in School St. from State to Albany St.

Coshocton, O.—City Council has passed, under suspended rules, resolution declaring it necessary to improve city water works system by construction of a 3,000,000-gallon reservoir on land now owned

by city on what is known as reservoir hill. Reservoir will be constructed from plans and specifications furnished by Chester & Fleming, of Pittsburgh, and which call for reinforced concrete walls with concrete top and bottom. Estimated cost is placed by architects at \$63,000.

Philadelphia, Pa.—Bids are being invited for first of work to be undertaken in expenditure of \$1,050,000 in improvement of water supply as provided for in \$11,300,000 city loan. These include extensions to filter beds, new pumps and distributing mains, in connection with Belmont plant, from which West Philadelphia is supplied; building of sedimentation basin at Torresdale and construction of independent supply main for South Philadelphia. Two new pumps and boiler equipment will first be provided for Belmont plant, where efficient but somewhat antiquated pump is to be discarded first. Pipes to be laid will include a force main, which will increase the flow in pipes that will be required to increase their pressure in event of a break in any one of several of West Philadelphia system. A new main is to be laid from filters to Baltimore Ave. and 53d St. This new main will supply territory west of 52d St. to the county line, between Baltimore Ave. and Lansdowne Ave. This will permit of increase in pressure of existing supply mains. The West Philadelphia improvements will cost \$150,000. These will be continuation of the improvements which have already cost \$600,000, principally for water mains. The \$500,000 for new supply main for South Philadelphia is preliminary step to building of independent main from Torresdale that will eventually cost \$1,500,000. Present plans contemplate a 48-in. main from Third and Market Sts., south on Third St. to Snyder Ave., west on Snyder Ave. to 21st St., and on 21st St. to Bainbridge. This main will, therefore, cut in to existing supply main at Third and Market Sts., and at Broad St. and Snyder Ave., which is terminus of existing main from Torresdale. At 21st and Bainbridge Sts. this new main will connect with another 48-in. main. This encircling main will be augmented by smaller main in Eighth or Ninth Sts., from Snyder Ave. to Bainbridge St.

Dayton, O.—Seven different concerns have submitted bids for furnishing gate valves to be used in connection with extension of water works system, the proposals being opened in office of City Purchasing Agent Fowler S. Smith. The bidders were the Rensselaer Valve Co., of Troy, N. Y.; Kennedy Valve Manufacturing Co., of Chicago; Darling Pump Manufacturing Co., of Williamsport, Pa.; James B. Clow & Sons, Chicago; R. D. Wood & Co., Evanston, Ill.; Roe-Stephens Manufacturing Co., Detroit; Ludlow Valve Manufacturing Co., Troy, N. Y.

Corpus Christi, Tex.—City will open bids on Jan. 8 for improvements to waterworks plant to cost \$300,000, bonds having already been voted.

Denton, Tex.—See "Miscellaneous."

Mission, Tex.—Bond issue for waterworks and electric light plant is being freely advocated by business men of city which will doubtless be submitted to people at early date through election for such an issue of bonds.

Provo, Utah.—Committees representing three wards of Provo Bench are engaged in securing subscriptions for stock in proposed waterworks system to supply towns of Orem and Provo Bench. It is estimated cost of system will be about \$22,000.

Tooele, Utah.—The present administration is endeavoring to buy Tooele City Water Company and convert it into municipal system.

Ephrata, Wash.—Election has resulted in favor of issuing water system bonds in sum of \$19,000. Avery Chambers is Town Clerk.

Dunnville, Ont., Can.—Special election will be held Jan. 4 to vote on question of issuing water works bonds in sum of \$12,000.

Hespeler, Ont.—City has voted in favor of issuing water works bonds in sum of \$35,000.

CONTRACTS AWARDED.

Pasadena, Cal.—N. O. Nelson Co. of Los Angeles has been awarded contract for carload of pipe and fittings by City Commission. Its bid was \$2,305.52 for 4,000 ft. of 4-in. standard, 2,000 ft. of 1-in. galvanized and 15,000 ft. of ¾-in. galvanized. Bids were also submitted by H. R. Boynton Co., \$2,313.15; Crane

Co., \$2,339.25; Fairbanks, Morse & Co., \$2,296.72; Pacific Hardware and Steel Co., \$2,364.08; Smith-Booth-Usher Co., \$2,337.56.

New Britain, Conn.—To Standard Pipe & Foundry Co., Bristol, Pa., at \$5,900, for pipe for water department.

Kansas, Ill.—To T. A. Hardman, Olney, Ill., contract for water distribution system.

Rock Island, Ill.—To P. Trenkenschuh, at \$13,735, for laying of water mains on 18th Ave., 1st to 8th Sts., on 1st St., 18th Ave. to a point 1,340 ft. north of the intersecting streets and on 1st St., 15th Ave. to Mill St.

Baltimore, Md.—To Pennsylvania Salt Co., Philadelphia, at \$5,955, for supply of sulphate of alumina for treating muddy water in lakes.

Baltimore, Md.—By Bd. of Awards for Water Dept. as follows: To Warren Fdry. & Machine Co., Phillipsburg, N. J., at \$157,642, for c-i. pipe and special castings; to Thompson Chemical Co., Baltimore, for calcium hypochlorite to be used in treating in the reservoirs at \$9,765, and Pennsylvania Salt Co., Philadelphia, for sulphate of alumina, at \$5,955.

Springfield, Mass.—A \$12,000 contract for water pipe and other fittings has been awarded by Board of Water Commissioners to R. D. Woods & Co. of Philadelphia, lowest bidders on contract. The Philadelphia concern will supply 1,500 12-ft. lengths of 8-in. pipe at \$20.95 a ton; 100 lengths of 12-in. pipe at \$20.35 a ton; 75 lengths of 16-in. pipe at \$20.35 a ton, and 50 tons of standard fittings at \$50 a ton. Cast iron pipe is now used exclusively by water department and old cement-lined pipe has nearly all been replaced. Other bidders on contract were the United States Cast Iron Pipe & Foundry Co. and the Warren Foundry & Machine Co. The prices offered by the United States Co. were \$21.20 a ton for all sizes of pipe and \$55 for standard fittings. The Warren Co. offered pipe of all sizes at \$21.50 a ton and fittings at \$49.

Schenectady, N. Y.—Contract for valves for use in water department has been awarded to Ludlow Valve Manufacturing Co. of Troy for \$3,947, lowest bidder. Other bidders were Rensselaer Valve Co. and the Eddy Valve Co. of Waterford.

Erie, Pa.—Board has awarded contract for carload of pipe to Standard Pipe & Supply Co., this city, for \$1,671.60. There were five other bidders. Pipe will be used to make service connections.

Philadelphia, Pa.—For cast iron water pipe, hydrants and specials, to Standard Cast Iron Pipe & Foundry Co., of Bristol, Pa., at \$7,000. G. S. Webster is chief engineer and surveyor.

Nashville, Tenn.—To T. I. Curtis & Sons, Nashville, at \$4,184 for laying about 15,000 ft. of water mains.

Norfolk, Va.—For meters and couplings contracts have been awarded as follows: To the Pittsburgh Meter Co., East Pittsburgh, Pa., for 5,000 $\frac{3}{4}$ -in. and 200 $\frac{1}{2}$ -in.; National Meter Co., New York City, 100 1-in.; Henry R. Worthington, New York City, for the necessary couplings.

Oconomowoc, Wis.—To R. Mierswa & Son, Oshkosh, Wis., contract for 1,200 ft. 6-in. cast iron water mains. C. J. Schoenike is City Clerk.

LIGHTING AND POWER

Tucson, Ariz.—City Council is said to be planning installation of new street-lighting system to cost about \$35,000.

Wadley, Ga.—Election has resulted in favor of issuing light plant bonds in sum of \$6,400. S. W. Omstrut is Clerk of Council.

Winfield, Kan.—Electric Light and Water Commission will advertise for bids for additional 500-kw. electric generating unit with auxiliaries. Plans will be completed shortly at which time bids will be called. W. J. Welfelt is Superintendent.

Boston, Mass.—Boulevard lamps that have been in operation along Huntington Ave. for two years will be extended through Copley Sq. and down Boylston and Tremont Sts. to Scollay Sq. Substitution of these lamps for old-style arcs will be made in a few weeks.

North Adams, Mass.—Radical changes and improvements in lighting of city streets are expected as result of new contract that has been agreed upon by city and North Adams Gas Light Co. Terms of contract have been decided, although papers have not as yet been

signed. According to new arrangement, city is to get arc lights at rate of \$78 per year instead of \$80 heretofore. Incandescent or serial lights are to be furnished city for sum of \$18 per annum instead of present price of \$25 per year.

South Hadley Falls, Mass.—Warrants have been posted for special town meeting to be held evening of Jan. 5 to see if town will issue bonds for establishing, purchasing, extending and enlarging of electric light plant in town limits and to take action on question. It is thought that bond issue of about \$40,000 will be asked which will pay for plant and provide capital for starting in on operation of the plant.

Detroit, Mich.—City Controller will issue bonds for \$350,000 for improving and extending municipal lighting system. George Engle is City Controller.

Jackson, Mich.—Present arc lamp lighting system in business district will shortly be replaced with ornamental lamps. Electricity to maintain them will be secured from the Commonwealth Power Co. Contract is for a period of three years, beginning Jan. 1.

Red Jacket, Mich.—Installation of an ornamental street-lighting system in business district is being discussed. The Houghton County El. Lt. Co. furnishes street-lighting service.

Gilbert, Minn.—Installation of ornamental street lighting system in Gilbert is said to be under consideration.

Jackson, Miss.—Ordinance providing for issue of \$160,000 in bonds for municipal electric light plant is being considered by Council.

Blue Springs, Mo.—Plans are being considered for installation of ornamental street lighting system on Main St.

Glasgow, Mont.—Plans are being considered for installation of municipal electric light plant.

Paterson, N. J.—Plans are being considered for installation of electric-lighting plant in destructor plant for supplying electricity for lighting streets of city.

Binghamton, N. Y.—Municipal lighting bonds in sum of \$148,000 have been sold to Lee, Higginson & Co., of 43 Exchange Pl., New York. Construction of municipal light plant station on Noyes Island property will be undertaken at once, and it is believed that within a year municipal light plant will be ready for operation. Board of Contract and Supply will accept bid from Binghamton Light, Heat & Power Co. to light city for one year and on Jan. 1, 1916, municipal lighting plant will be placed in complete operation for first time.

Port Chester, N. Y.—The Port Chester Board of Trustees have voted to establish white way on North and South Main St. There will be 67 standards, carrying four lights each. It will take three months to change over the lighting system.

Norwalk, O.—City Auditor L. Snook will receive bids until Jan. 27, at noon, for electric light bonds in sum of \$100,000.

Philadelphia, Pa.—Park Commission has opened bids for lighting the parks next year. There are 415 park lights. Councils provided for 50 additional for 1915. The Philadelphia Electric Co. bid \$6.77 per light per month for lights on poles and \$7.41 for lights attached to underground conduits.

Madison, S. D.—City Council will make extensive improvements to municipal electric light plant at expenditure of about \$20,000. A new engine and generator will be installed.

Knoxville, Tenn.—Plans are being considered for replacing present ornamental lighting system on Gay St. with nitrogen filled lamps. Present street lighting contract ends in October.

Dallas, Tex.—Following announcement of F. G. Sykes of New York, president of the American Light & Power Co., that certain improvements were contemplated by Texas Power & Light Co., directors of this organization have authorized sale of \$700,000 in bonds to Eastern capitalists. Revenue so derived will be used in improvement in Texas.

Denton, Tex.—See "Miscellaneous."

Mission, Tex.—See "Water Supply."

Richmond, Va.—Administrative Board has taken action on plans offered for improved lighting system in Swansboro, and it has authorized installation of large number of arc lights.

Tacoma, Wash.—City Council has ordered installation of new system of lamps on C and other streets, according to specifications prepared by city engineer. Plans call for metal standards mounted with single lamp, at cost of \$17,241.

CONTRACTS AWARDED.

Rockmart, Ga.—By City Council for new machinery for municipal electric light plant, as follows: The Ames Iron Works, of Oswego, N. Y., will furnish boilers and Allis-Chalmers Co., of Milwaukee, Wis., the generators.

St. Paul, Minn.—Oscar Keller, commissioner of public utilities, will recommend to city purchasing commission that contract be let to St. Paul Gas Light Co. for period of two years for electric lighting of city streets at prices set out in bids opened.

Paterson, N. J.—Municipal ownership was sidetracked for time being by Board of Works when three-year street lighting contract with Public Service Electric Co. was authorized.

Bergen, N. Y.—Board of Light Commissioners has accepted bid of Westinghouse & Electric Manufacturing Co., of Pittsburgh, Pa., of \$2,628, for outdoor sub-station, consisting of two 25 K. B. A. transformers, with necessary lighting arresters, fuses and switches, to be located on land of Eugene D. Snyder, north of West Shore Railroad, bank of transformers, consisting of two 15 K. V. A. and one 10 K. V. A., connected in delta, to be located at village pumping station, and one 15 horse-power motor. This is part of necessary plant and equipment for supplying village and its inhabitants with light, current to be obtained from power line of the Niagara, Lockport & Ontario Power Co., a mile north of village, for which people voted at special election held on Nov. 10.

Rochester, N. Y.—Contract for electrical work at Convention Hall has been awarded to Rochester Electrical Contracting Co. for \$2,552.

Harmony, Pa.—Public Service Commission has approved contract of the Harmony El. Co., of Harmony, for furnishing electricity for lighting streets of Koppel.

Philadelphia, Pa.—It has been announced that contract between city and Philadelphia Electric Co. for 1915 will be executed at 1914 rates with proviso that when agreement is reached as to new rates they will apply for entire year from Jan. 1.

Dallas, Tex.—Contract for lighting of Dallas streets for three years, beginning Jan. 1, 1915, has been awarded Dallas Electric Light & Power Co. by Board of City Commissioners. Contract for three-year period will amount to more than \$200,000 on present number of about 1,300 arc lamps. The company will furnish current for each 2,000-candlepower arc lamp at \$56 a year. City will pay \$28 a year for illumination of ornamental street lamps, which burn half of night. Contract stipulates that city will be furnished, free of cost, current for 1,000 incandescent lamps used during State Fair of Texas and also for lighting of Municipal Building to value not to exceed \$1,200 a year.

FIRE EQUIPMENT

Denver, Col.—Bids will shortly be asked for motor pumping engine.

Ansonia, Conn.—Appropriation of \$7,500 has been petitioned for by Charters Hose Co., of which \$4,000 is for purchase of piece of motor apparatus and balance for new station and site for same.

Bridgeport, Conn.—Fire Commissioners are planning to purchase aerial truck.

Stamford, Conn.—Funds are being raised for purchase of auto-chemical apparatus for Springdale Fire Co.

Stamford, Conn.—Fire Department is asking for \$10,000 motor aerial truck and for motor work truck to be used in instruction and for other purposes.

Westport, Conn.—Installation of modern fire alarm system is proposed.

Peoria, Ill.—Purchase of 3,000 ft. of lead-covered cable for fire alarm system is being considered. T. W. Wurm is Chief.

Indianapolis, Ind.—Jacob P. Dunn, city controller, expects to readvertise for bids for bond issue of \$80,000 for improving fire department.

Logansport, Ind.—Board of Public Works has ordered city clerk to advertise for bids for new type of motor truck as preliminary to making improvements in fire department.

South Bend, Ind.—Mayor F. W. Keller is urging purchase of an 85-ft. motor aerial truck. I. W. Sibel is Chief.

Waterloo, Ia.—If plans now under consideration by members of fire committee of City Council are approved entire local fire department will be motorized during coming year.